FIRST AERO WEEKLY IN THE WORLD

FLIGHT

The AIRCRAFT ENGINEER

A JOURNAL DEVO... PRACTICE, AND ... LOCOMOTIO... ...PS

OFFICIAL ORGAN ... KINGDOM.

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FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1929.

Nov. 5 .... R.Ae.S., R.Ae.C., and Air League Conference on Necessity for Municipal Airports, at Inst. of Electrical Engineers.

Nov. 7 .... Lecture, "Recent Developments of Fuels and Dopes for Aircraft Engines," by Dr. A. E. Dunstan, before R.Ae.S. and Inst. Ae.E.

Nov. 9 .... H.M.S. "Engadine" Annual Re-Union Dinner, Adelphi Hotel.

Nov. 13 .... Sqdn.-Ldr. Bert Hinkler on "My Solo Flight to Australia" at Westminster School.

Nov. 15 .... R.Ae.S. Informal Dinner and Discussion on High-Speed Aircraft.

Nov. 21 .... Lecture, "The Inspection of Materials," by Mr. L. W. Johnson, before R.Ae.S. and Inst.Ae.E.

Nov. 28 .... Lecture, "Flying and Maintenance from the Owner's Point of View," by Sq.-Ldr. H. M. Probyn, before R.Ae.S. and Inst. Ae.E.

Dec. 5 .... Lecture, "Recent Work on the Autogiro," by Senr. J. de la Cierva, before R.Ae.S. and Inst.Ae.E.

Dec. 12 .... Lecture, "The Development of Materials for Aircraft Purposes," by Dr. W. Rosenhain before R.Ae.S. and Inst.Ae.E.

1930—

Jan. 22 .... Lecture, "The Strategical Mobility of Air Forces," by Gp.-Capt. C. L. Courtney, before Royal United Service Inst.

EDITORIAL COMMENT

AN evil fate appears to be dogging the work of Imperial Airways, Ltd., this year. After a record of four years' flying without accident resulting in injury to any fare-paying passenger, a series of mishaps have taken place which, unmerited though they be, may do harm in shaking the faith of the general public in the safety of British air transport on regular air routes. Those who still entertain superstitious fears may derive a certain amount of re-assurance from the fact that we have now had three serious mishaps, and that therefore a long spell without another accident may be expected. First there was the case of the twin-engined Handley Page machine, which, due to failure of one of its engines, was compelled to come down in the Channel. Then a three-engined de Havilland machine caught fire from one of its wing-tip flares in coming in to land at Jask; and now we have the saddest mishap of all in the loss of the Short "Calcutta" with its seven occupants in the Gulf of Genoa, some miles off Spezia.

The Flying-Boat Disaster

If one examines the history of accidents in flying over a period of years, it is found that there are very many which, it must be concluded, should be classed as "avoidable," in that it is possible to say that if this or that or the other had been done the accident would not have happened. It may be an error of judgment on the part of the pilot; it may be sudden illness of the pilot; it may be fire on board, an occurrence so rare as to be negligible in British aviation; or it may be a number of other causes, any or all of which might have been avoided "if" some other course of action or some other precaution had been taken.

In the case of the last accident, as far as can at present be seen, no one was to blame in any way. The Short "Calcutta" was on its way with passengers and, presumably, mails to Genoa. The machine had, it is reported, left Naples at 10 a.m. and, after a halt at Ostia, proceeded towards Genoa, where she was due at 4.30 p.m. From this point the

reports become rather conflicting. It appears, however, that something went wrong on board, what we do not know. It may have been engine trouble or it may have been shortage of petrol. At any rate, the "City of Rome," as the machine was named, sent out distress signals by wireless, which were picked up by Italian land stations. The point is that, if the various accounts and reports that have appeared are to be trusted, the last distress signal was heard shortly after 3 p.m.

The Spezia correspondent of the *Daily Mail* gives an account of an interview with the captain of the Italian steamer *Famiglia* in which it is stated that this vessel, which was on her way from Cette to Naples, came up with the flying-boat at about 10 p.m. The *Famiglia* carried no wireless, and so came across the "Calcutta" quite by chance, knowing nothing of the wireless messages sent out from Spezia in response to the distress signal. Attempts to take the occupants of the flying-boat off one by one having failed, the *Famiglia* succeeded in throwing a line across to the "Calcutta," and a hawser was sent over and made fast. After towing for about a quarter of an hour, the hawser parted, and the *Famiglia* was unable to find the flying-boat again.

This, briefly, appears to be all that is definitely known at present about this very distressing accident. If the *Daily Mail* account is accurate, which there does not appear any reason to doubt, it emerges that none of the vessels proceeding to the scene after the sending of the wireless instructions sent out from Spezia succeeded in finding the flying-boat, which is not to be wondered at in view of the fact that darkness must have been approaching before any vessel could have reached the locality where the flying-boat came down. That the *Famiglia* found her was, apparently, purely by chance. And it does not require any very intimate knowledge of the sea and of seamanship to realise the enormous difficulties with which the skipper of the *Famiglia* was confronted. Darkness, a howling gale, seas running so high as to wash right over the vessel. The relative movements of steamer and flying-boat so large and so violent that to transfer the unfortunate people from the flying-boat to the steamer must, quite obviously, have been impossible. In our opinion the skipper did wonders in getting a towline across, and one can only conclude that he and his crew did all that was humanly possible.

The only, and the fundamental, problem left is, what was the cause of the descent of the machine? The answer to that will presumably never be known. It is possible that one of the three engines developed trouble. There is nothing to indicate that this was so, but it must be included among possibilities. In the weather conditions obtaining at the time, with gusts reported to have reached 60–70 m.p.h., the machine might well have been forced down by partial failure of one engine only.

Another possibility is that, having encountered very strong adverse winds, the machine might have been running out of fuel, and that it was this which necessitated the alighting. This possibility is rather discounted by certain reports which state that, during the time the machine was being towed, her engines were kept running to assist in the towing operation. The *Daily Mail's* account does not, however, make any mention of this, and it may be that there is no foundation for the reports. Finally, it is conceivable that the machine was in perfect order, but was forced down by stress of weather. While not probable, this explanation cannot be entirely dismissed.

Looked at from whatever angle one chooses, it does not appear that this accident was one which can be regarded as having been avoidable. Everyone, the Italian authorities and the Italian vessels, seem to have done everything possible. The pilot of the ill-fated flying-boat must be considered to have handled his machine with admirable skill. Otherwise, he would never have alighted on the water safely. The wireless operator appears to have sent out his distress messages as long as he could. But the elements proved too formidable. And we are once more left to mourn the loss of lives in tragic and, this time, dramatic circumstances. That aviation will ever be entirely free from accidents of this nature is extremely doubtful. Other and older means of transport have them. Liners still go down with heavy loss of life, and railway trains still have collisions. And there is, as far as can be seen at present, nothing in this air accident to shake one's belief in the relative safety of air travel. The circumstances were unusual in the extreme, and may not be duplicated again for many years.

If there is anything to be learned from the loss of the "City of Rome," it is that the Short "Calcutta" flying-boat is a remarkably seaworthy machine. If the last S.O.S. was sent out shortly after three in the afternoon, and the *Famiglia* came up with the machine at ten o'clock at night, the machine must have remained afloat for something like seven hours. Considering that a gale was blowing at the time, and that the sea was very rough indeed, we consider that this is proof positive that in all normal weathers, a forced descent on the water need cause no anxiety at all. When a wind is blowing with a velocity of more than the stalling speed of a machine, no aircraft could be expected to live indefinitely, and the "Calcutta," in our opinion, did well to last seven hours under such circumstances.

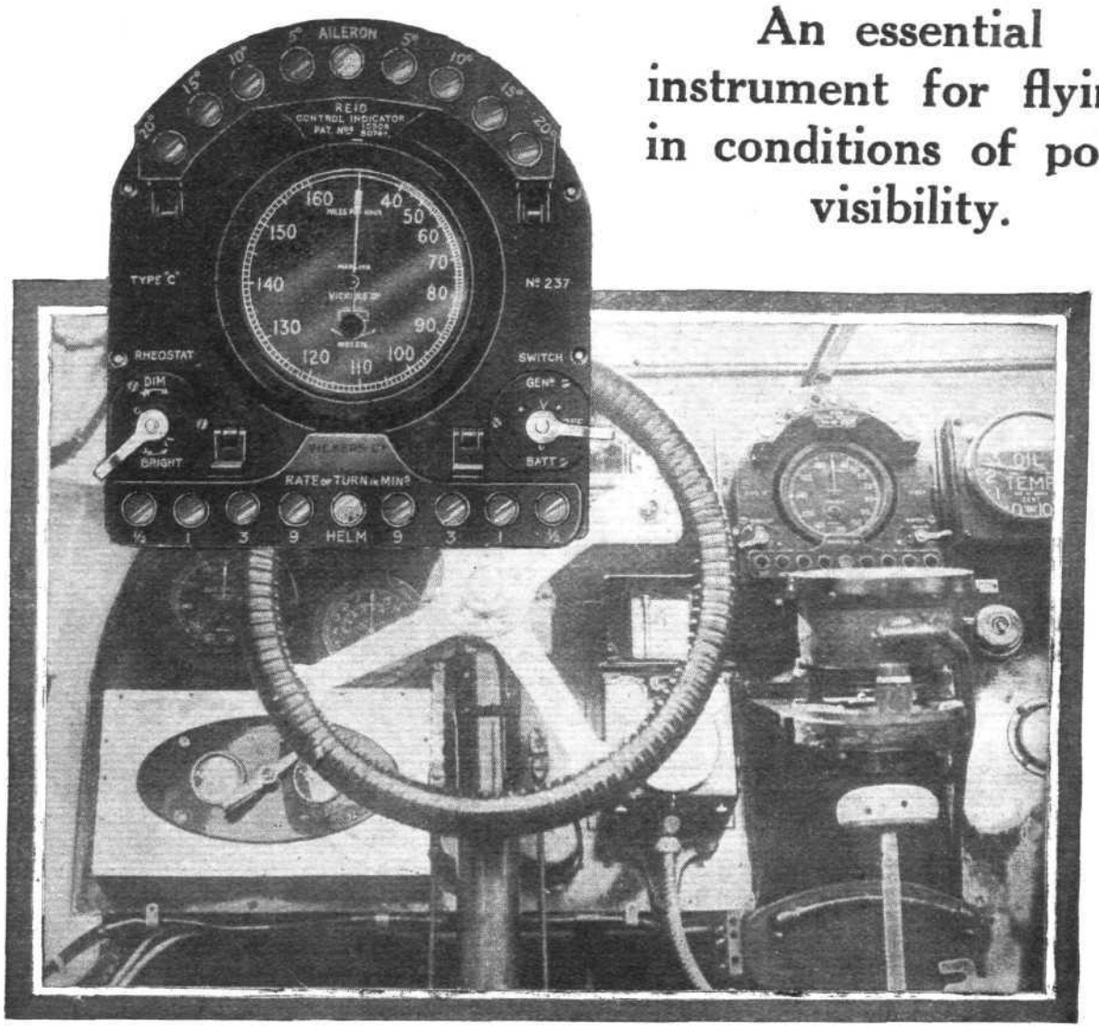
◈ ◈ ◈ ◈

Twelve days' European Tour by Gipsy Moth

MR. DEREK SCHREIBER, of the 11th Hussars, has just completed a most enjoyable trip in his Gipsy Moth. With only 12 days' leave he arranged an ambitious route, but was able to carry it out in spite of bad weather. Leaving from and returning to Farnborough, Hants, his route was as follows: Lympne, Brussels, Munster, Hanover, Berlin, Dresden, Prague, Vienna, Budapest, Vienna, Wiels, Munich, Furth, Frankfort, Cologne, Brussels, Lympne; and in the early stages of the trip, despite a 40 m.p.h. contrary wind, and only flying 100 miles the second day, he reached Budapest in three days. Accompanied by a brother officer as passenger, he flew almost 32 hours. He and his passenger in flying kit weighed 29 stones, which, with two large suitcases, maps, and a few spare parts (none of which were touched), was a good load. Mr. Schreiber says that his Moth behaved splendidly and gave no trouble. When he totalled up his log book on his return he was horrified to find that for the hours flown the routine attention which he had carried out was a good bit less than advised in the maker's handbook, and states that had anything gone amiss, he would have had himself to blame. (Would that all Moth owners were as considerate of the makers as Mr. Schreiber!) His oil consumption is particularly interesting in that he only used 1½ gallons for the whole tour. This is at the rate of 0·375 pint per hour, which is less than the allowance of ½ pint per hour given in the maker's handbook. He remarks: ". . . It is difficult to understand why more people do not make use of the light car of the air, and enjoy a really instructive and invigorating holiday, and if any Moth owners are contemplating such a trip, as I have just made, I am convinced that they will never regret their decision."

The Vickers-Reid Control Indicator

An essential instrument for flying in conditions of poor visibility.



Captain C. D. Barnard, who in seven days, with Her Grace The Duchess of Bedford, recently flew from England to India (Karachi) and back, writes:—

"The Reid Control Indicator was invaluable—especially considering the fact that a great deal of **the journey was flown in clouds or in dust-storms. It worked perfectly** and I should insist upon a 'Reid' being fitted to any machine if I were to contemplate a similar flight on it."

August 17th, 1929.

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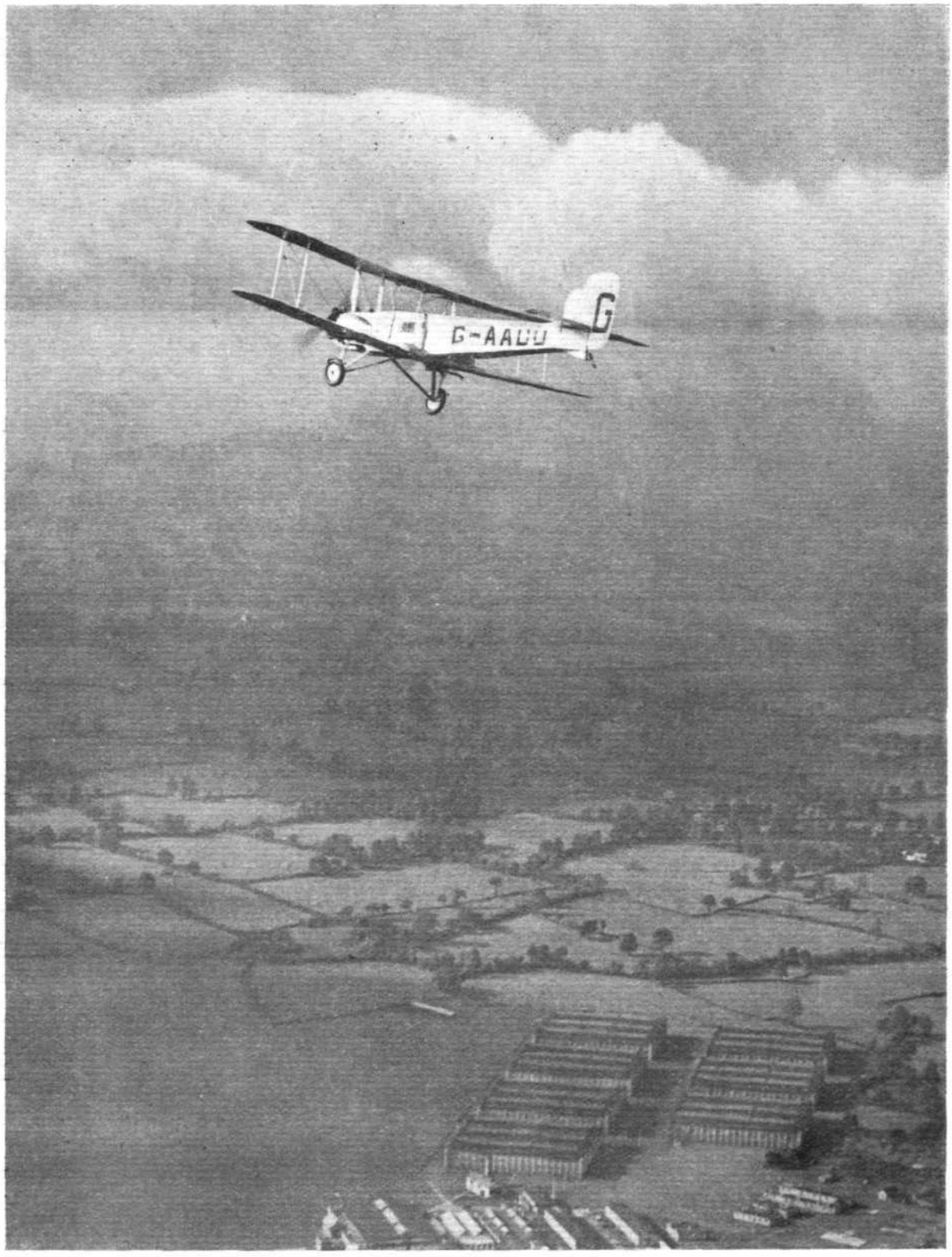
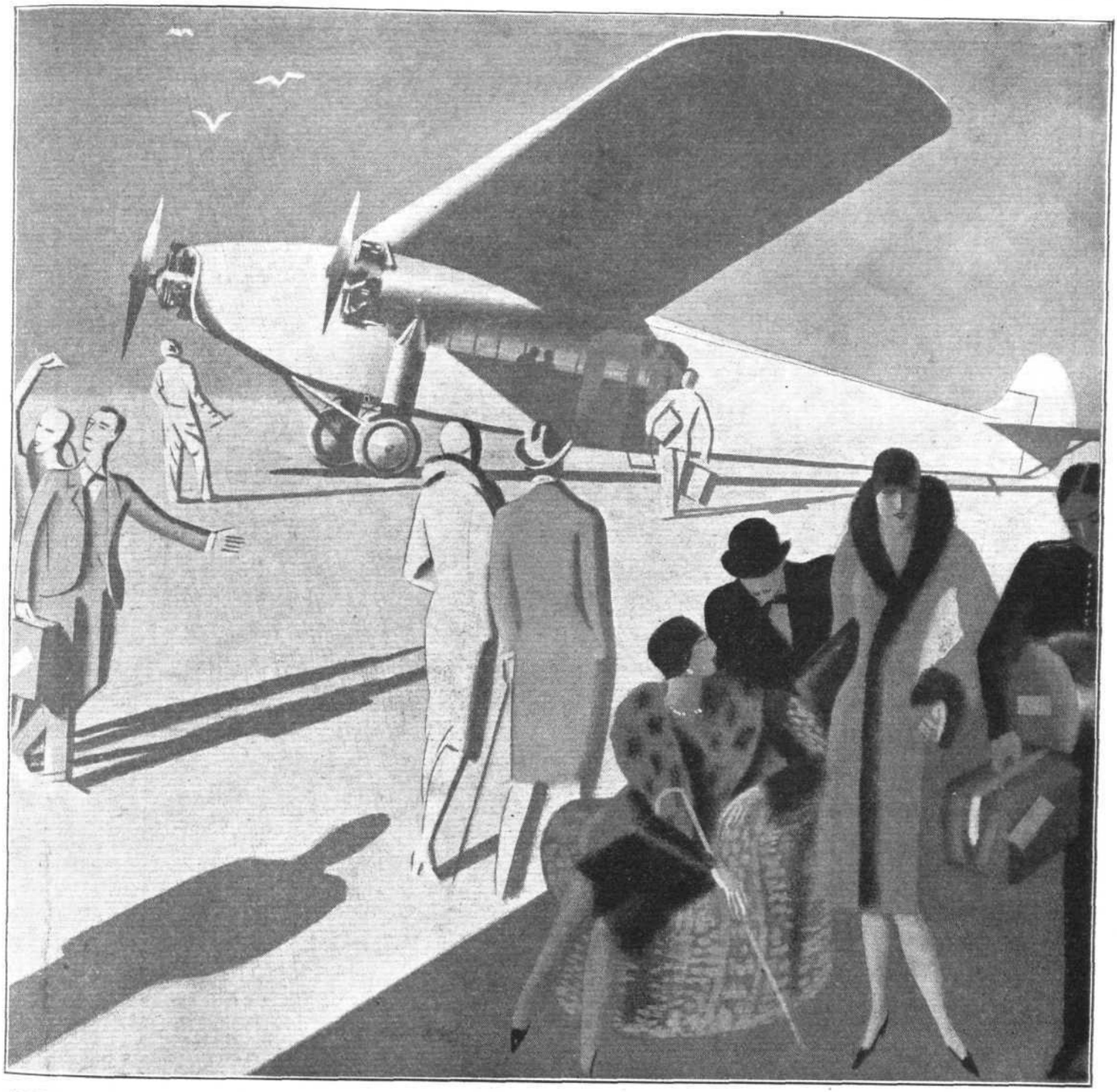
R.A.F. Official Photograph. Crown copyright

DROPPING A "MOULDIE": A Hawker "Horsley" of No. 36 Squadron discharging its torpedo over the Firth of Forth. It will be recollected that the long-distance "Horsley," generally similar to the Service type, carried more than its own weight in fuel, crew, etc.



"GLOSTER" SURVEY MACHINE

WITH the exception of air taxy work, air survey is the only form of aviation which at the present time is real "commercial" aviation in that it pays for itself as a commercial undertaking without any artificial encouragement in the form of subsidies. In the 1928 Annual Report on Civil Aviation, matter and statistics were given which indicate the great amount of work carried out by the two British firms at present engaged upon air survey and air photography: the Aircraft Operating Company and the Air Survey Company. These two firms have been in existence for some years, but hitherto they have carried out their work, very successfully be it said, with aircraft not specifically designed for air survey and air photography. It was, if we remember aright, at an informal dinner of the Institution of Aeronautical Engineers that Major Hemming outlined the sort of aircraft which he would like to have for air survey work. At the time his requirements probably appeared to those present as somewhat ambitious, but the practical experience since gained, and the vast amount of work carried out, does not indicate that Major Hemming was far wrong. He has been some tine in realising his ambitions, but at last the Gloster Aircraft Co., Ltd., came forward with a suitable design, and two machines of this type were laid down, one of which was exhibited (in skeleton) at the Olympia Aero Show. The machines have now been completed, and the FLIGHT photographs which accompany these notes show that of the Aircraft Operating Company in flight, the photographs being taken from another aeroplane. We have not yet had the official results of flight tests, and so do not know whether the predicted performance has been attained, but there is no reason to believe that the actual figures differ materially from the estimated. The machine



THE PULLMAN OF THE SKIES

The Avro 10 is the British version of the Fokker F7-3M. It embodies all that is excellent in modern air travel, comfort, speed and great reliability under all climatic conditions. It is equipped with three 230 h.p. Armstrong-Siddeley engines and the whole machine is British built to the Air Ministry's standard of airworthiness. This type is used by the Dutch, Swiss, Italian and Canadian air lines and has recently been selected for passenger and freight service by Australian National Airways Ltd., who have ordered four Avro 10's for passenger and freight traffic on their Brisbane to Sidney route.

AVRO·10

Cruising speed 100 m.p.h. Range from 400 miles upwards.
Payload up to 2000 lbs.

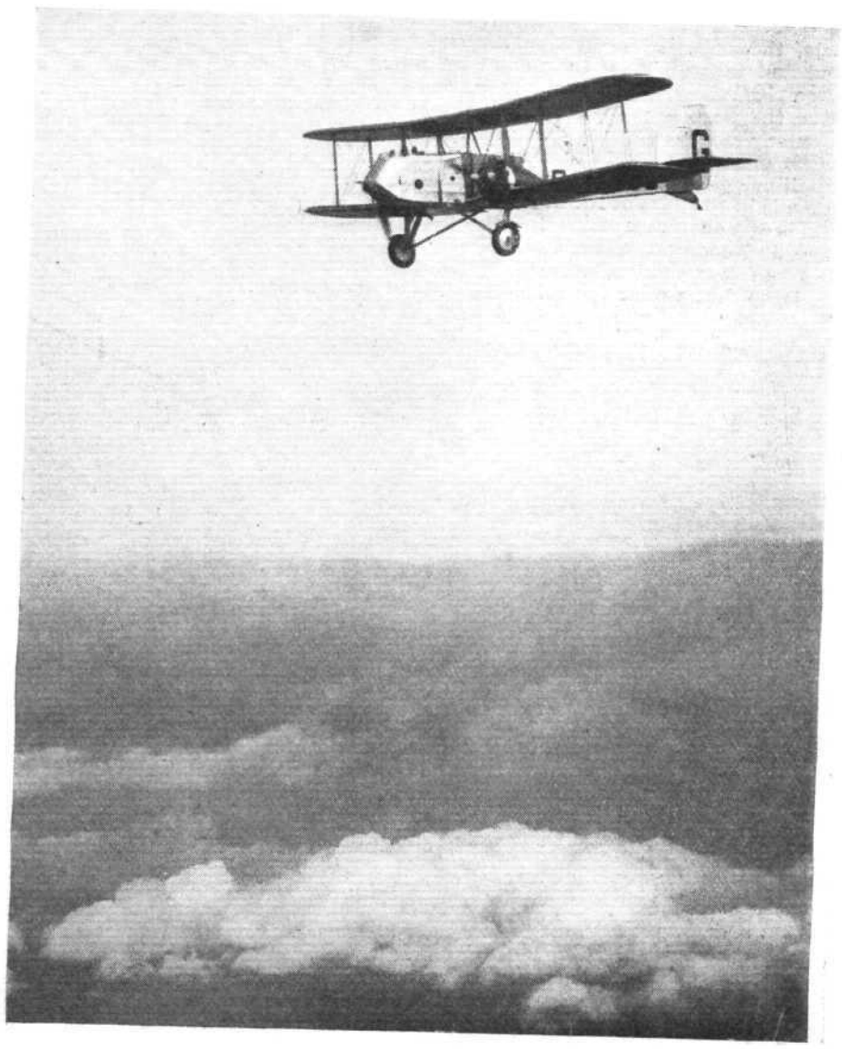
Specifications and full particulars both of the above plane and of the Avro 5 (seating pilot and four passengers) will be supplied on application. Those interested should write also for special catalogue of the famous "Avian" light aeroplane.

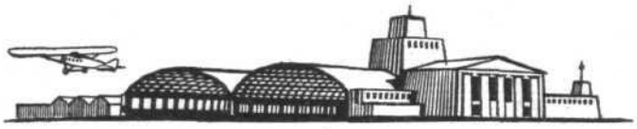
A. V. ROE & CO. LTD., 166 PICCADILLY, LONDON, W.1. *Works:* MANCHESTER AND HAMBLE, SOUTHAMPTON

Save time by using the Air Mail.

actually appears capable of "flying on one engine," and even of climbing slowly with one of the engines throttled right down.

As the Gloster Air Survey machine was described in detail, and illustrated in our issue of July 11, we do not propose to give a detailed description here. It may, however, be of convenience to readers if we recall briefly the main features, etc. The machine is of Gloster all-metal construction, and is a twin-engined (Bristol "Jupiter") tractor biplane. The pilot's cockpit is in the nose, and the "cabin" aft of the cockpit is equipped with special photographic equipment, three separate camera positions being provided. The overall dimensions are: Length, 48 ft. 6 in.; span, 61 ft.; wing area, 1,025 sq. ft. The tare weight is 5,615 lbs., and the maximum permissible gross weight, 8,570 lbs. The normal petrol tankage is 200 gallons, and oil, 27 gallons. The survey load (crew of two and equipment) is 800 lbs. Following are the *estimated* performance figures: Full speed at 1,000 ft., 131 m.p.h.; at 20,000 ft., 114 m.p.h.; service ceiling, 21,900 ft.; endurance at 1,000 ft., and cruising speed of 110 m.p.h., 4·5 hours; at 20,000 ft. and cruising speed of 100 m.p.h., 6·5 hours. The second machine is for sale, and would make a good commercial aircraft.





AIR TRANSPORT

AIRPORTS

By FRANCIS WOOD, M.Inst.C.E.
(Borough Engineer and Surveyor to the County Borough of Blackpool)

(*Continued from page* 1134)

Acreage

AN airport 800 yards in diameter means 154 acres or thereabouts. It is possibly the case that such an area of land in some districts near to the town may be available, but it would be difficult in the generality of cases to discover such an expanse. It is not absolutely necessary that the area should be in one large open space. Runways in three or four directions radiating from a centre or from two points would prove to be equally satisfactory. Such an area would be possibly obtainable, and only about 80 to 100 acres actually required. The strips should have the required length and be about 200 yards in width. A skilful pilot would be able to bring his machine safely to the ground on a much narrower width, but allowances must be made for other than the most skilful. There must be a margin, and it should be as much over 200 yards in width as can reasonably be obtained. Obviously if the traffic develops to a large scale, the area, if large enough, would enable machines to land and take off more than one at a time. Figs. 1 and 2 (page 1134) show sites that might be laid out, and which would serve the purpose; such an area would be about 80 acres in extent, and would enable a machine to take off and land in the prevailing winds that usually apply in this country. It will be gathered that there are several variations that may be made in the lines of the boundary of the airport, where the land is of a character which does not permit of it being in one large and comprehensive area. The main factor should be that runways should be available in the direction of the winds, so that a pilot can take off and land at any time.

Surrounding Land

It would obviously be more economical in working and more satisfactory from every point of view, that the area should be on a complete field, and particularly so for 'planes employed on night work. It may be assumed that an airport of the size that would meet the average requirements should have an area of about 80 to 120 acres. It may be desirable to acquire even more land so as to control the development surrounding the airport, and also it may be that such extra land, when the airport is developing into a business proposition, may be leased or sold at a profit to assist in paying for the airport area.

Showrooms, Car Parks and Spectators

The popular airport will naturally develop the surrounding land. It can be assumed that builders of aeroplanes may establish themselves on the boundary, so that they may have the airport as an easy access from which to test their machines before they are disposed of. They may desire show rooms on or near to the site even if they do not manufacture their machines there.

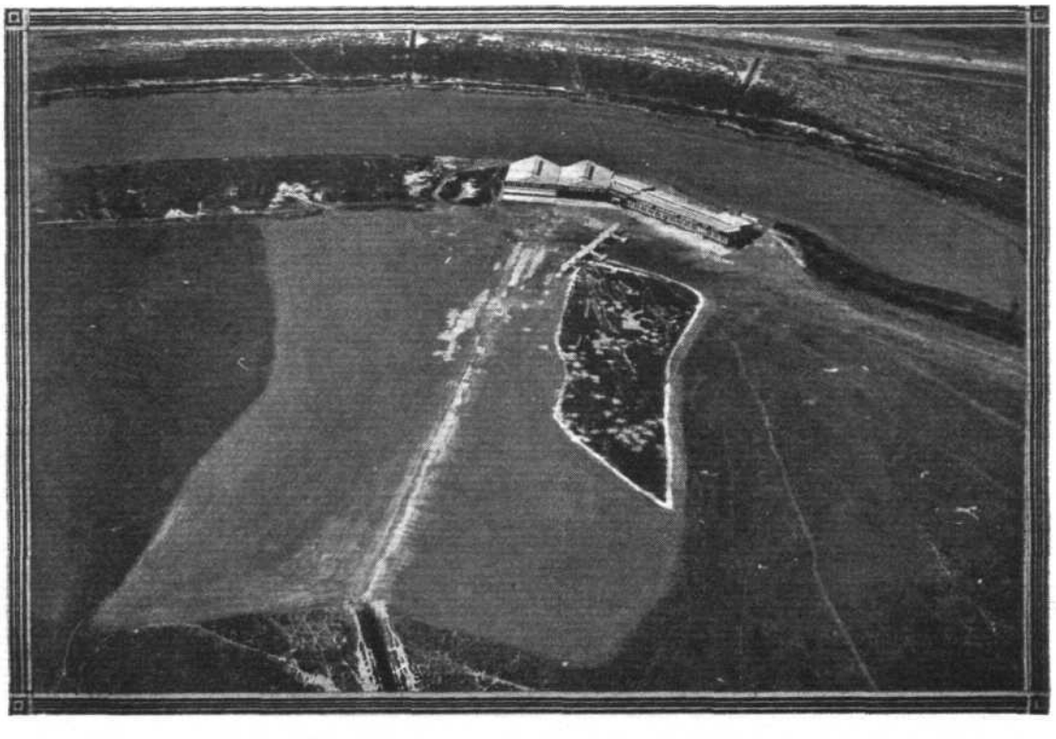
The airport will naturally, if it is used popularly, require a motor car parking space which should be of considerable size to accommodate a large number of motor cars, together with the space for the eventual hangars, administrative buildings, space for petrol supply, and the necessary road communications. There should also be space for spectators out of the line of the runways.

Air Pageants

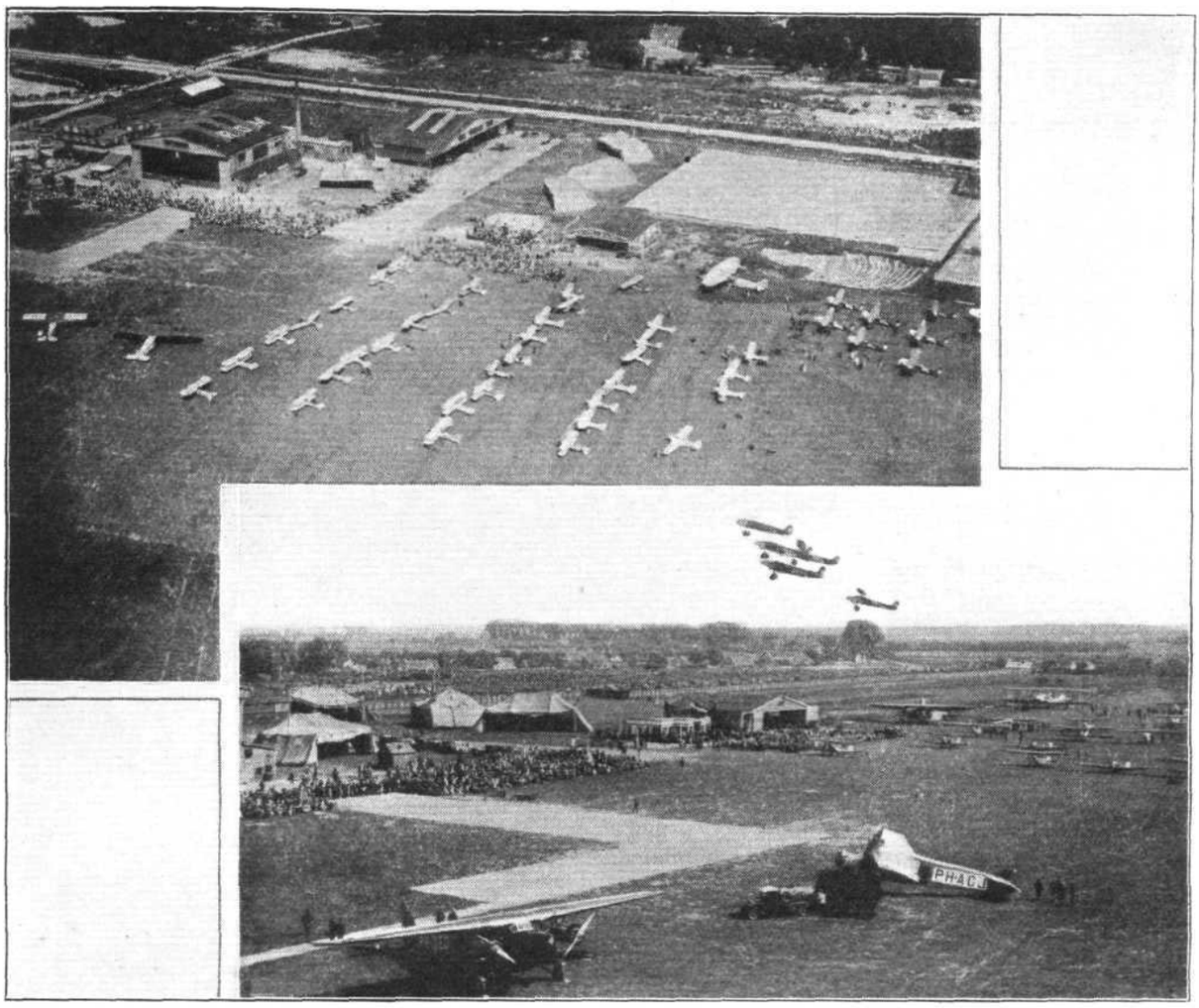
The air pageant, which appears to be an annual event at Hendon, is a very attractive spectacle, and if similar pageants can be arranged on a similar basis and proved equally popular and attractive, the probability of the airport being a proposition that will maintain itself would not be far distant.

Hangars

While it is only absolutely requisite to provide the airport with runways for machines to land and take off from, it will become almost an essential that a hangar and offices should be established, because the owner or pilot of a machine



A Colonial Airport: Melbourne Aerodrome, which is situated alongside the Yarra River, about two miles from Hobson's Bay.



Airports and Flying Meetings: The Rotterdam Airport photographed on the occasion of the Air Meeting held there on June 27-29, 1929.

landing on an airport does not desire only to land, he will require a hangar in which to house the machine when it is not flying. If it is left out in the open, a strong wind might have a damaging effect upon the machine, and although it would be ordinarily safe if anchored down, no owner would contemplate leaving a machine in the open which has cost anything up to £1,000 or more if it was possible to avoid it. He would preferably go to an airport that had a hangar available. A machine left out at night in the open is subject to unauthorised persons pilfering and damaging it, notwithstanding that the airport may be subject to supervision and control.

Office Accommodation

Similarly, office accommodation is equally essential. It is in the office that the caretaker or groundsman or superintendent should be housed. Some person should be in control of the area to take the fees, keep a daily record of the machines that land and take off, of those that use the hangars, the passengers on the joy flights, or distance flights, the sale of petrol, oil, etc.

Telephone and Wireless

A telephone is, of course, essential, and it may in the future be necessary to have a wireless receiving and transmission set, which would assist a pilot to make a landing in a fog, and for the assistance it can give in intimating to him his position, which he may have difficulty in establishing through the atmospheric conditions that may be prevailing. At the present time this is done at Croydon, and several selected other airports for the British Isles. The weather reports would also be available by this means. Electricity would be used for illuminating the landing ground for night flying.

The Law Regulating Airports

A local authority may acquire the necessary land for the airport by applying to the Air Council under Section 8 of the Air Navigation Act of 1920 for powers to negotiate or purchase compulsorily (this clause is given below).

The local authority may select a site (which should be one that will be approved by the Air Ministry) and obtain powers to purchase by a private Act. One advantage of this method is that the Corporation can acquire the land compulsorily and any opposition to the acquisition or to the formation of an airport on the particular site chosen is reviewed by Committees of both Houses of Parliament. The Blackpool Corporation was the first to obtain powers by a private Act, and the section dealing with the undertaking is given *in extenso*. It will be of interest to compare the two methods. There are probably advantages by the latter method which would appear to be desirable.

Air Navigation Act, 1920. Section 8 is as follows :—

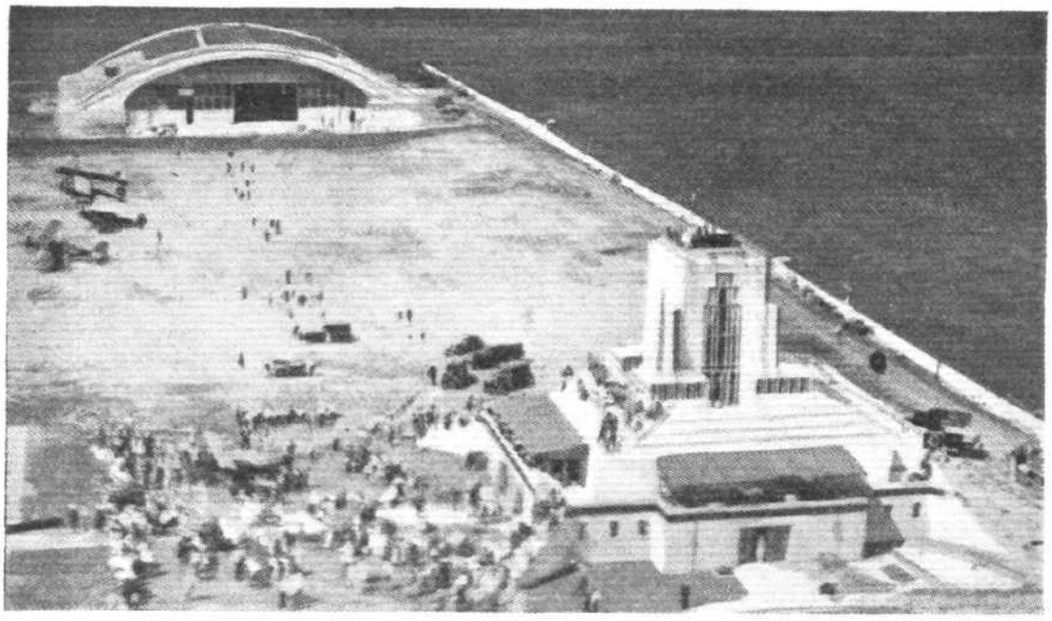
8.—(1) The Air Council and any local authority to which this section applies with the consent of the Air Council, and subject to such conditions as the Air Council may prescribe, shall have power to establish and maintain aerodromes (including power to provide and maintain roads and approaches, buildings and other accommodation and apparatus and equipment for such aerodromes) and to acquire land for that purpose, by purchase or hire, in the case of a local authority by agreement, and in the case of the Air Council either by agreement or in accordance with the provisions of this Act as to the acquisition of land by the Air Council. Land may be acquired by a local authority under this section either within or without the area of the authority.

(2) A local authority providing an aerodrome under this section shall have power to carry on in connection therewith any subsidiary business certified by the Air Council to be ancillary to the carrying on of an aerodrome.

(3) The local authorities to which this section applies are the common council of the City of London, the councils of counties and county boroughs, and urban district councils, and the expenses of those councils under this section shall

be defrayed, in the case of the common council of the city of London out of the general rate, in the case of a county council as expenses for general county purposes, and in the case of other councils as expenses incurred in the administration of the Public Health Acts, 1875 to 1908.

(4) A local authority may borrow for the purposes of this section, in the case of the common council of the city of London under the City of London Sewers Acts, 1848 to 1897, and in the case of a county council under section 69 of the Local Government Act, 1888, as if those purposes were mentioned in that section, and in the case of a council of a county borough or urban district shall have the same power of borrowing under this section as they have under the Public Health Acts, 1875 to 1908, for the purpose of defraying any expenses incurred by them in the administration of those Acts, but money so borrowed shall not be reckoned as part of the debt of such local authority for the purposes of any enactment limiting the powers of borrowing by the authority.



An American Airport: Sky Harbor, Chicago, showing the Administration Building in the foreground and the hangar in the background.

(5) For the purpose of the purchase of land under this section by a local authority, the Lands Clauses Acts shall be incorporated with this Act except the provisions of those Acts with respect to the purchase and taking of land otherwise than by agreement.

Private Act, 1928, relating to Airport

The section of the Blackpool Improvement Act, 1928, dealing with aerodrome undertaking is as follows and would act as a precedent, where necessary :—

" (1) Upon the acquisition by the Corporation of the lands in the townships of Hardhorn with Newton and Marton in the rural district of Fylde on the deposited plans or any part of those lands the Corporation may establish thereon an undertaking comprising an aerodrome and works and conveniences for games and sports, together with all proper or convenient hangars, garages, repair shops, buildings, refreshment rooms, offices, approach roads, footpaths, works and conveniences connected therewith.

(2) The Corporation may carry on, equip, maintain and manage the undertaking authorised by this section and may make such charges in respect thereof as they may think fit and may let the same or any part thereof for such period and upon and subject to such terms and conditions as they may think fit.

Provided that the charges to be made in respect of the aerodrome shall be subject to the approval of the Secretary of State for Air.

(3) (*a*) The Corporation may make bye-laws with respect to the undertaking authorised by this section.

(*b*) The provisions of the following sections of the Public Health Act, 1875 (namely) :—

Section 182 (Authentication and alteration of byelaws).
" 183 (Power to impose penalties on breach of bye-laws).
" 184 (Confirmation of byelaws).
" 185 (Byelaws to be printed, etc.).

so far as they relate to byelaws made by an urban sanitary authority shall apply to all byelaws made by the Corporation under the powers of this section, except that as regards the confirmation of byelaws relating to the aerodrome and inquiries in relation thereto, the Secretary of State for Air shall be substituted for the Ministry of Health.

(4) The aerodrome established by the Corporation under this section, and any subsidiary business connected therewith, shall be in the same relation to the Air Council and the Secretary of State for Air, and subject to the like control by them under the Air Navigation Act, 1920, or any Act amending, replacing or consolidating the same as if this Act had not been passed.

(5) Upon the acquisition by the Corporation of the lands referred to in this section, the Corporation may stop up the footpaths shown on the deposited plans, as intended to be stopped up, and thereupon all rights of way over and along the same shall be extinguished.

(6) The Corporation shall make full compensation to all parties interested in respect of any private rights of way extinguished by virtue of this section, and such compensation shall be settled in manner provided by law with reference to the taking of lands otherwise than by agreement.

(7) All money received by the Corporation on account of the revenue of the undertaking authorized by this section shall be carried to and shall form part of the general rate fund, and all payments and expenses made and incurred in respect of that undertaking shall be paid out of that fund.

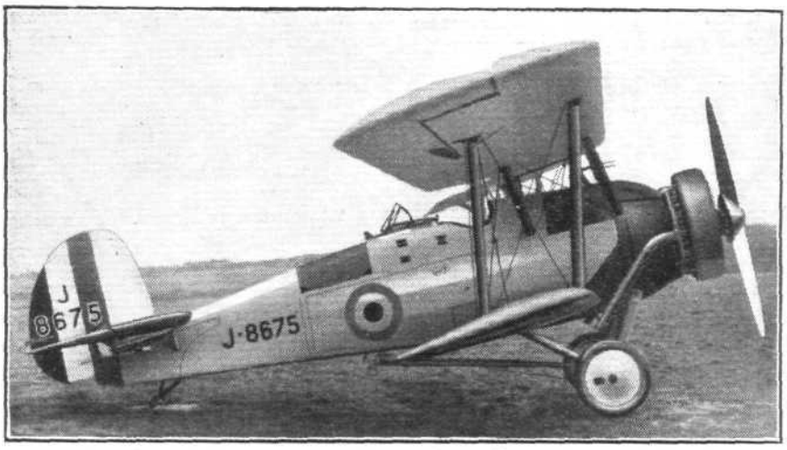
(8) The Corporation may, if they think fit, apply money received by them on account of the revenue of the said undertaking in the construction, renewal, extension and improvement thereof in the provision of working capital for such undertaking, or in the formation of a reserve fund.

(9) The Corporation shall keep their accounts of the said undertaking so as to distinguish capital from revenue, and as to revenue so as to show under a separate heading or division, on the one side all receipts in respect of the undertaking, and on the other side all payments and expenses in respect of the undertaking, such payments and expenses being divided so as to show, in each case, the amounts expended in respect of each of the following purposes (that is to say) :—

(*a*) The working and establishment expenses and cost of maintenance of the undertaking.
(*b*) The interest on moneys borrowed by the Corporation for the purposes of or connected with the undertaking.
(*c*) The requisite appropriations, instalments or sinking fund payments in respect of moneys borrowed for the purpose of the undertaking.
(*d*) All other expenses (if any) of the undertaking properly chargeable to revenue.
(*e*) The amount (if any) paid to reserve fund to be formed as hereinafter provided.

(10) The Corporation may (if they think fit) provide a reserve fund in respect of the said undertaking by setting aside such an amount as they may from time to time think reasonable, and (if they invest the amount so set aside, or any part thereof) investing the same in statutory securities, and accumulating the same until the fund or funds so formed

ARMSTRONG WHITWORTH
AIRCRAFT



THE ALL-STEEL ATLAS

(ON WHEELS, FLOATS OR SKIS)

THE all-steel Atlas is the best aircraft for land or sea reconnaissance.

It is the standard Army Co-operation two-seater of the Royal Air Force.

Its steel construction accounts for its unrivalled durability and ease of maintenance. Fitted with the world-famous Armstrong Siddeley Jaguar engine (plain or geared type), its speed, climb and ceiling fulfil the severest Service requirements. It is produced on the grand scale by the best equipped aircraft works in Europe.

PERFORMANCE FIGURES

ATLAS WITH JAGUAR ENGINE AND TOWNEND RING

Fuel, 75 gallons (337 litres). Oil, 7 gallons (32 litres). Military Load, 880 lbs. (400 kgs.)

	Plain Engine.	Geared Engine
Approx. total weight	4000 lbs.	4115 lbs.
	1820 kgs.	1870 kgs.
Speed at ground level	143.5 m.p.h.	149 m.p.h.
	231 km.p.h.	240 km.p.h.
" " 5000 ft.	139.5 m.p.h.	145 m.p.h.
" " 10000 ft.	134 m.p.h.	140 m.p.h.
" " 15000 ft.	125 m.p.h.	131 m.p.h.
" " 1000 metres	226 km.p.h.	236 km.p.h.
" " 3000 metres	216 km.p.h.	225 km.p.h.
" " 5000 metres	193 km.p.h.	204 km.p.h.

		Plain Engine.	Geared Engine.
Time to	5000 ft.	5.25 minutes	4.25 minutes
" "	10000 ft.	12.5 "	10.5 "
" "	15000 ft.	26 "	21.75 "
" "	1000 mtrs.	3.5 "	2.5 "
" "	3000 "	12.5 "	10.25 "
" "	5000 "	34 "	27.5 "
Absolute Ceiling		19000 ft.	19100 ft.
		5800 metres	5830 metres
Service Ceiling		17300 ft.	17700 ft.
		5280 metres	5400 metres

Maximum allowable R.P.M. 2200. Normal R.P.M. 2000

SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT LIMITED

Works and Aerodrome: Whitley, Coventry. London: 10 Old Bond Street, W.1

amounts to the maximum reserve fund for the time being prescribed by the Corporation, which fund shall be applicable to answer any deficiency at any time happening in the income of the Corporation from the undertaking, or to meet any extraordinary claim or demand at any time arising against the Corporation in respect of the undertaking, or for payment of the cost of renewing any part of the works forming part thereof, or for any extension of the said works or otherwise for the benefit of the undertaking, and so that if that fund be at any time reduced, it may thereafter be again restored to the prescribed maximum, and so from time to time as often as such reduction happens.

Resort may be had to the reserve fund under the foregoing provisions, although such fund may not at the time have reached, or may have been reduced below the prescribed maximum."

Memorandum by Air Ministry on Airports

The Air Ministry have issued a pamphlet on the general requirements of a site for a civil aerodrome as follows:—

"*Location* 1.—A civil aerodrome must be situated as near as possible to the centre of the town it is required to serve, otherwise a very large proportion of the time saved in travelling by air will be lost in travelling between the aerodrome and one's final destination.

2. It should be borne in mind that the chief air routes from a town will probably radiate in only one or two main directions. In order, therefore, to avoid the majority of passengers having to cover the same ground twice, *i.e.*, having to travel from the town to the aerodrome and then fly back over the town, the aerodrome should, other conditions being equal, be situated on the side of the town from which the majority of the routes radiate.

3. In considering the matter from the aspect suggested in paragraph 2 above, it should, however, be remembered that, especially in the case of an industrial town, the aerodrome should never be situated on the side of the town over which the smoke, dust and consequent fog is blown by the prevailing wind. That is to say, it should not be situated on the side of the town opposite to that from which the prevailing wind blows.

4. An aerodrome situated near a river or a large expanse of water will often suffer from fog.

5. A plateau often makes an excellent site for an aerodrome as high ground is unaffected by low-lying fog, and is usually easy to drain. Too high a plateau should not, however, be selected as, on days when the clouds are very low, pilots might suffer from the handicap of entering the cloud almost immediately after taking off from the ground, while it would also be very difficult under such conditions, for an incoming pilot to find the aerodrome.

6. The aerodrome should not be situated at the foot of or even near a hill or very high ground as the latter may cause a serious obstruction and thus endanger the aircraft.

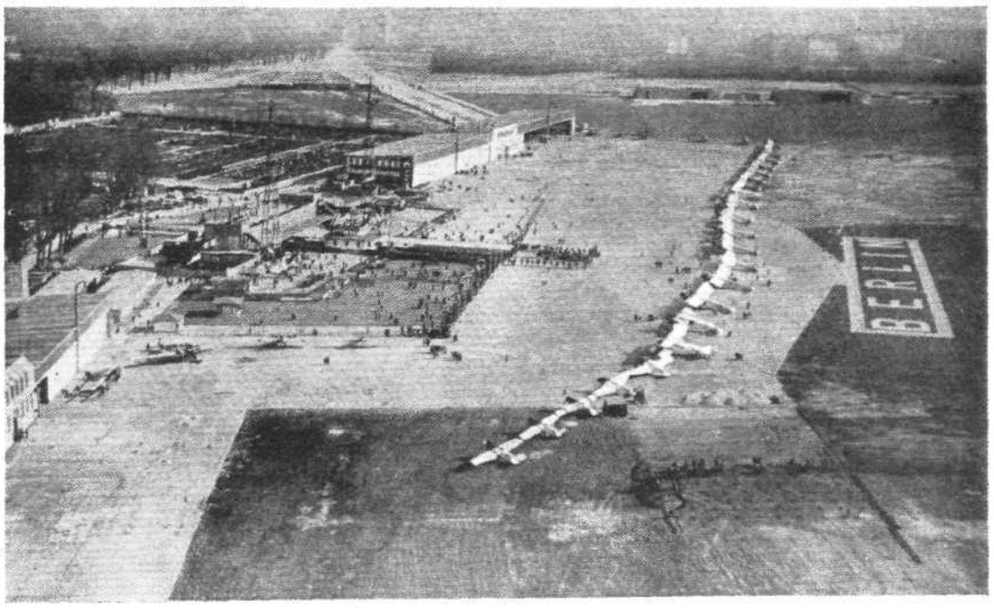
Size.—1. The dimensions of an aerodrome which is to be used by the larger types of aircraft should not be less than 600 yards in all directions and should, if possible, be 800 to 1,000 yards. Only in very exceptional circumstances will a site affording in any direction a clear run of less than 600 yards be licensed and in that case the absolute minimum will be 500 yards. Should it be necessary to reserve a site measuring less than 600 yards in any direction all the ground outside of and within 100 yards of the perimeter of the aerodrome must contain no obstruction higher than the average 3-ft. fence or hedge.

2. For light or small aeroplanes, a site measuring 400 yards in all directions will suffice, subject to conditions regarding a clear perimeter contained in paragraph (1) above.

Obstructions.—1. A site should not be chosen which is surrounded by or even adjacent to insuperable obstruction such as church spires, tall chimneys, etc. Arrangements can usually be made for the removal of trees.

2. An obstruction diminishes the available space for landing and taking off by a distance equal to ten times its own height from the foot of the obstruction. If for instance, in a certain direction, the aerodrome measures 700 yards and there is a row of tall trees 60 feet high on the border of the aerodrome, the useful available space will be only 500 yards, that is 700 yards minus 200 yards (ten times 60 ft.).

A German Airport: The Tempelhof Aerodrome at Berlin, where commercial 'planes from all parts of Europe arrive and depart.



Gradient.—1. The surface should be smooth enough to allow a motor car to be driven over it at 20 m.p.h. without any inconvenience to the occupants.

2. Failing some artificial covering the surface should be composed of turf and should be strong enough to withstand a pressure of 1 ton per sq. ft.

3. If the surface will not withstand a pressure of 1 ton per sq. ft. it may be necessary to drain it and to build runways composed of clinker tarmac or concrete, such runways being 500 yards long and 100 ft. broad. A rough but good test for any such surface is to drive a fully laden 3-ton lorry across it slowly. If there is no tendency for the wheel of the lorry to sink into the ground, it may be taken for granted that under ordinary circumstances neither the wheels nor tail skid of any present-day aeroplane will sink in.

Communication.—It is very necessary that an aerodrome should have quick communication either by road, train, bus, or rail with the town it is intended to serve, and it will certainly be necessary to have a telephone laid on.

Services.—When the buildings are erected so as to create a fully equipped aerodrome it will be necessary to have water and electric light laid on.

Licences.—1. Section 7, paragraph 1, of the Air Navigation Consolidation Order, 1923, says that "a place in Great Britain and Northern Ireland shall not be used as a regular place for landing or departure by aircraft carrying passengers for hire or reward unless it is licensed for the purpose by the Secretary of State and any conditions of such licence are complied with.

2. In accordance with the Air Navigation Directions (1928) (and 7) Section 11, paragraph 103, 'Licensed Aerodromes.' Aerodromes are divided for licence purposes into two categories:

(*a*) Aerodromes licensed for use only by the licensee and by individuals specifically authorized by him

(*b*) Aerodromes licensed for public use.

It will follow naturally that the majority of Aerodromes

will require ' Public Use ' licences as only this type of licence will be of use to a local authority." February, 1929.

Boundary Marks and Wind Sleeve

A fairly comprehensive idea of the requirements that have to be considered in the selection of a site has been given in the above notes, there are other details which are almost compulsory before a licence is given. The boundary of the airport should be clearly defined; this can be done by an angular board 8 ft. long each side being 1 ft. 6 in. wide, painted chrome yellow and black alternately. Fig. 3 shows the type of

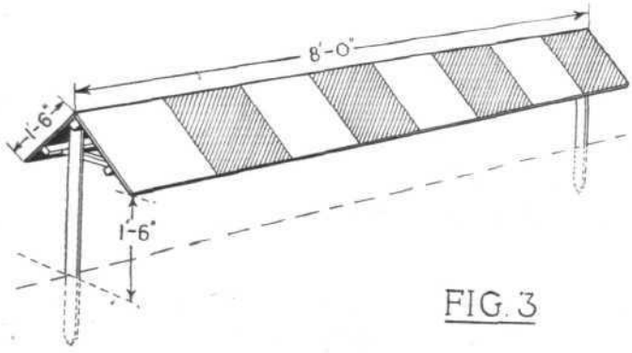


FIG. 3

boundary mark; the hatched and plain squares showing the painted areas. Being at an angle, each board placed 50 yards apart will be clearly visible not only from the air but to the pilot in his machine as he takes off from the ground.

A wind sleeve indicator or " sausage " should also be erected in a convenient position about 25 ft. in height so that the pilot may clearly see the direction of the wind.

Customs and Railway Interests

If the airport became one that would be used by machines from foreign countries it would become necessary that a portion of the ground should be enclosed and customs officers be in attendance to undertake their usual official duties.

The airport will, perhaps, come to be regarded as a main railway station; in fact, the railway companies have obtained powers to acquire land for airports and to work them; they will, doubtless, in any town use a properly furnished airport that may have been established by a local authority. There would be, therefore, in a properly equipped airport: waiting rooms, dressing rooms, lavatory, and w.c. accommodation for ladies and gentlemen, a portion of which so provided are, or should be, revenue producing. A table of charges for the landing, the use of the hangar, are included in the appendix. There is usually a charge for spectators. Apparatus for the extinguishing of fires is an adjunct which must also be available.

Flying Clubs

A clubroom, if provided, would be let at a rental to a flying club which would almost certainly be established as soon as the airport is licensed. Show-rooms for machines that are on sale can be let to manufacturers. All these accessories would require consideration, and it will be for the authority to determine to what extent these buildings should be developed. The cost of the maintenance should be, if possible, covered, so that it will as soon as possible not be a charge on the rates.

Local Authority; Private Company

A local authority's method of finance is different from that of a private limited company in this important fact, that the capital expended has to be repaid regularly and in a definite period of time; it is regarded as a charge on the undertaking, so that at the end of the period the land stands in the accounts as being of no value, although it would, if sold, be of great value. Similarly, the cost expended on the buildings has to be repaid within a much shorter term than the land, so that if the revenue is not sufficient to cover the repayment and interest on the money expended in the year, the difference is a charge on the general rate.

A private concern may have the capital outstanding indefinitely; any loss is a charge on the capital, and the sale of petrol, oil, etc., the charge for spectators, proportion of profits of joy flights, rental of hangars, percentage on passenger flights, will be the source of income to set against the expenditure. It is not until there is an excess that this is paid out in dividends or into a fund for depreciation.

Cost of Preparation of Site

The preparation of the site so as to fulfil the conditions that are laid down by the Air Ministry may be little if the land is reasonably even, has no greater inclination than is set forth in the memorandum, and will withstand the traffic likely to come upon it. It may be found that land that may be available at a high cost may be cheaper than land which is low in cost but which is irregular, requires draining and excavating and resurfacing to bring it to a satisfactory state. Farm land which is now pasture land may previously have been arable land, and there may, especially where the land has been damp, be a series of undulations that the farmer has made in order to clear the surface of the water, that otherwise made it water logged. The hollows are called " reans," and in each there is usually a field tile drain. If the land is, in wet weather, still sodden, it may be that the field drains are not functioning because the compression of the soil over the drain has become so great that air cannot get to the drains.

Drains

These drains should be opened up and covered over with rough clinker, as shown in Fig. 4, so that the moisture and air can find its way to the drains, and if the hollows are filled up to the level of the mound with ashes and fine materials to finish it off, the surface can be made very even and dry even in wet weather to satisfy the requirements.

The cost will vary and depends on the price that has to be paid for the clinker or ashes, and the depth of the reans from the top of the mounds. If the subsoil is clay and the clay exposed, a system of drainage would have to be laid down, but if clinker or ashes is available and the trench be filled up with this material to the surface, a covering over the whole of the exposed clay with 3 in. of ashes, and finally with fine dust intermixed with grass seeds which will grow sufficient to act as a binding agent, will prove satisfactory.

It is desirable to have the clinker, if it is that from a refuse destructor, as free as possible from glass, nails, tins, etc. Aeroplanes are fitted with pneumatic tyres, and a puncture might cause some damage to the machine. Also the tail skid cuts into the ground and throws up a certain amount of the soil or material of the ground, and any such material might damage the tail of the machine.

FIG. 4

Boggy Land

There may be the necessity to provide a greater depth of ashes on land which is boggy, as a depth of clinkers can be consolidated quite sufficiently to give a satisfactory surface, and thus land which may be unsuitable for any other purpose could be developed as an airport. The airport does not require the same consolidated surface as a road because, as already explained, the aeroplane does not obtain its propulsive power by exerting it upon the wheels on which the aeroplane rests on the ground, and such a composition as has been indicated will withstand an occasional lorry of 3 tons in weight travelling over the surface, but naturally such a composition would not withstand a lorry travelling over the same track many times without making the track visible and objectionable. The aeroplane when it lands and takes off leaves scarcely an impression, even if it traverses the same lines many times. What is essential is good drainage, so that no water stands on the ground under usual or unusual conditions. The old macadam from a road, including the fine material, will also be found to be useful in consolidating the ground.

Dry Surface

It is inadvisable that the ground should be too dry—at any rate, to the extent that fine material can be blown about—as the dust would cause trouble to the engines. It is therefore advisable that the turf should be retained or grass seeds sown on the surface, so that when the grass becomes established the roots will bind the surface material.

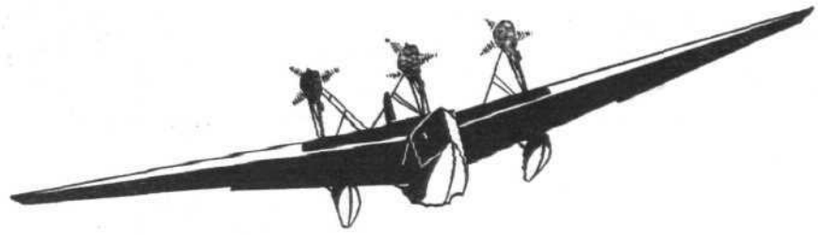
In the maintenance of the ground, whenever a machine lands, the marks made by the tail skid should be resurfaced by the groundsman, so that the grass may recover its position

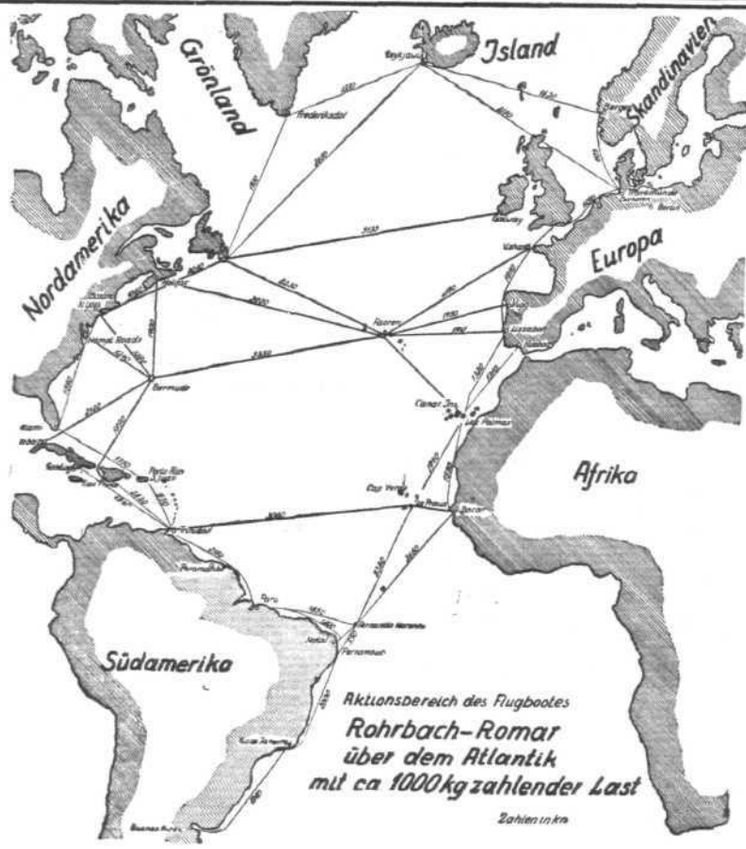
Space in Front of Hangars

The front open space of the hangar for a minimum of 120 ft. width should be concreted or laid with tar macadam, but where the machines constantly pass from the concrete to the turf there is a tendency at the junction for the ground to become very much worn, uneven, and in wet weather to become miry.

Round the edge of this concrete the ground should be excavated away for a width of 10 or 12 ft. and filled in with broken stone, properly drained and covered over with ashes and grassed over.

(To be continued)





Point 1. Seaworthiness in a sea of force 5 (Beaufort Scale) and a range of 4000 km. with adequate payload being guaranteed at contract conclusion.

Point 2. The boat being stranded on a storm-swept night (November 16-17th, 1928) without suffering the least injury.

Point 3. Standing up excellently in official seaworthiness tests (sea of force 5), on December 11th and 13th, 1928.

Point 4. Crowning acceptance flights by world's record; lifting a maximum payload of 6450 kg. to a height of 2000 m.

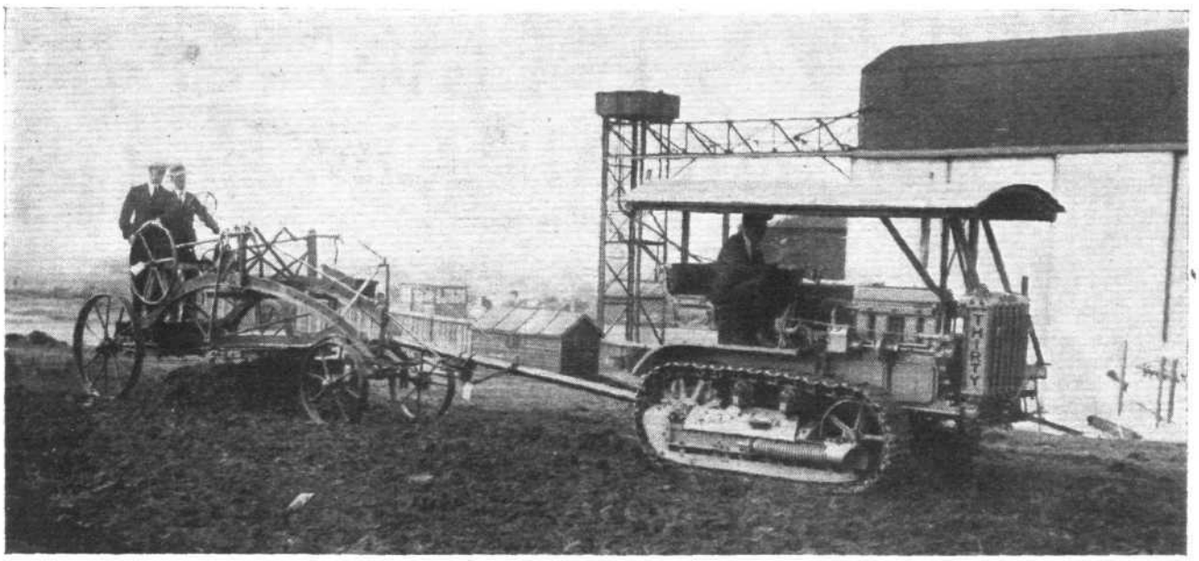
Point 5. Flying ten hours non-stop from Travemünde to Stockholm and back, by order of Deutsche Luft Hansa.

Point 6. Flying non-stop over five countries, viz.: Germany (Travemünde)—Holland—England—Norway—Denmark and back to Travemünde airport, this flight also being made by order of Deutsche Luft Hansa.

The six foregoing feats prove the "Rohrbach-Romar" to be the trans-ocean flying-boat of the future.

For catalogue apply to:

ROHRBACH METALL-FLUGZEUGBAU G.m.b.H., Berlin.



The Caterpillar Grader in action (FLIGHT *Photo.*)

AIRPORT GRADING AND LEVELLING

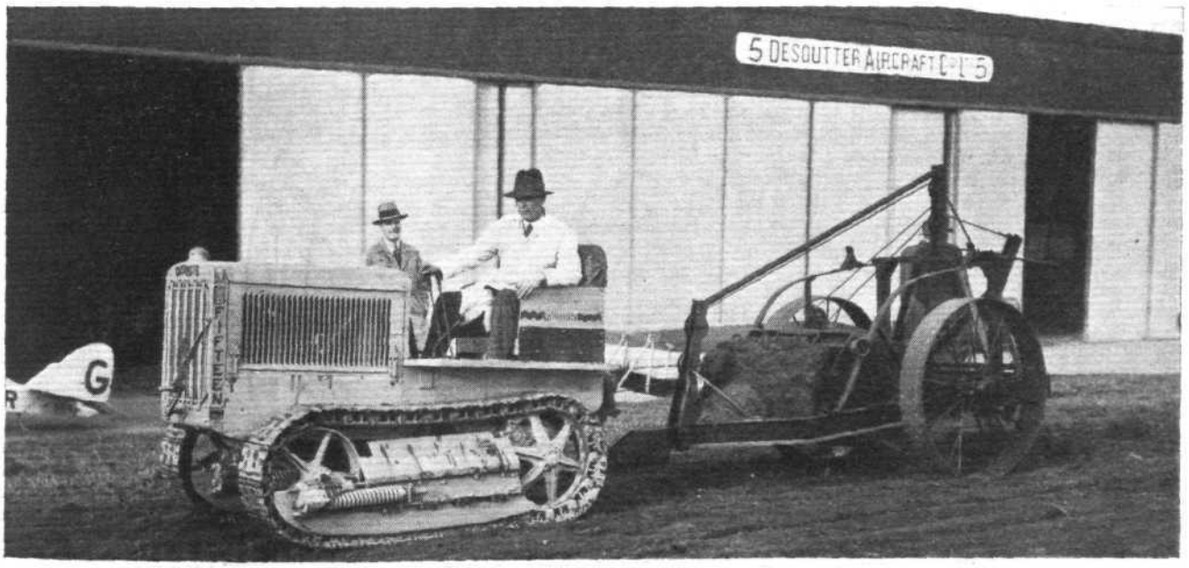
TRACTOR TRADERS, LTD., demonstrated their caterpillar tractors at work on various forms of work necessary when grading and levelling aerodrome surfaces, on Wednesday, October 16, at Croydon Aerodrome.

Our photographs show the Caterpillar Fifteen pulling a Miami scraper in which the scraper is in the form of a hopper, and is one-man operated so that when the hopper is full the driver raises it and drives straight on to where the surplus earth is to be dumped. The Caterpillar Thirty is shown operating a light "Caterpillar" scraper type grader. This grader scrapes the earth along and, being controlled by one or two men from the grader itself, can be regulated to scrape off the high ground and fill the hollows as it goes along.

Both of these forms of implement have been used in the grading and levelling of many aerodromes in this country, and will be more so in the future; it is in America, however, where they are really extensively used, as in that country the provision of aerodromes has already become a very big business.

Caterpillar tractors are available in five different sizes

ranging from 10 to 60 h.p., and the range of duties for which they are suitable would fill a book, in fact there is hardly a job connected with the preparation of rough ground to form an aerodrome which they cannot efficiently perform when drawing the suitable tools. Rolling, grading, levelling, hauling—also hauling the machines in and out of the hangars when the aerodrome is finished—all come alike to this form of tractor and it is difficult to realise how things were done before tractors were available. These tractors are made by the Caterpillar Tractor Co. of California, and Tractor Traders of Smith Square, Westminster, are the agents for this country.



The Miami Scraper with a full load (FLIGHT *Photo.*)

PRIVATE FLYING AND CLUB NEWS

WIRELESS FOR THE PRIVATE OWNER

AS private ownership is rapidly growing, the question of training private individuals to fly is receiving an increasing amount of attention, and wireless is now being used for this purpose.

Hitherto, for the purpose of giving instructions in the air communication has been by means of a voice-pipe system, which, though simple, is yet very efficient. Two tubes are used, one from the instructor's mouthpiece to the pupil's ear-piece, and the other from the pupil's mouthpiece to the instructor's ear-piece. At a convenient point along these two tubes a small bye-pass unit is fitted on the side of the fuselage, and the two tubes passing side by side through this unit have small tubular borings connecting them. This arrangement allows either of the two persons to hear what he himself is saying, and at the same time does not detrimentally affect the hearing of the other.

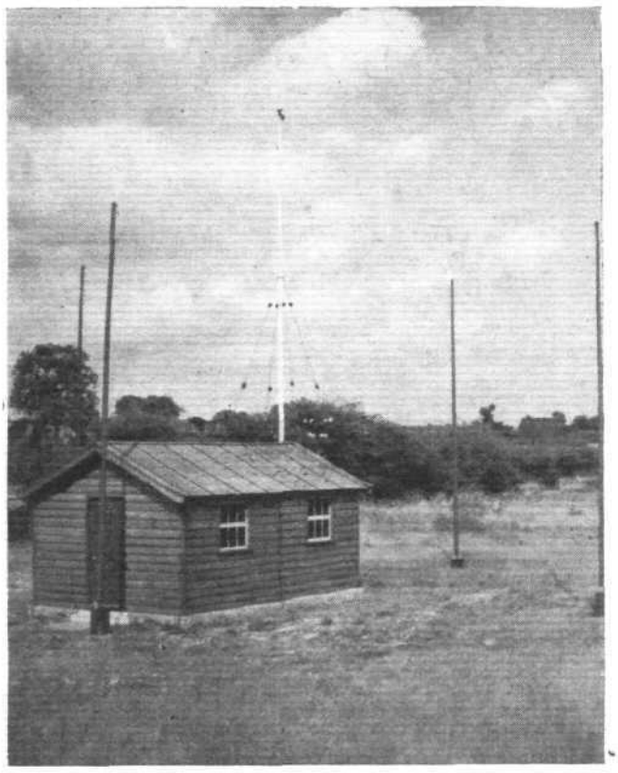
This system of voice-pipes is easy to install, and needs no maintenance. In fitting wireless to a light aeroplane, therefore, it seems obvious to combine this system with the wireless equipment, and the results recently obtained are highly satisfactory.

Training a pupil involves some five to fifteen hours' dual instruction in the air before the pupil is safe enough to fly solo; throughout this period he becomes accustomed to receiving his flying instructions through the voice-pipe, and there is a sound psychological reason why he should continue to do so when wireless is fitted and the instructor leaves the machine. For this reason a flying training light aeroplane receiver has just been put on the market by Alfred Graham & Co., Ltd., of Slough, and it is more than probable that it is the smallest receiver for its capabilities yet designed. The photograph shows this receiver, which is small enough to be fitted almost anywhere in the aircraft. The receiver itself weighs just under 4½ lbs. and is 5½ in. by 4¾ in. by 8¾ in. A single tuning control is employed, which is the knob and dial at the left-hand end of the receiver. The tuning range is from 600–1,000 metres, and two screened high frequency stages precede a detector and one powerful transformer output stage. A number of new patents are incorporated in the design of this receiver.

A screened battery box contains some really minute high- and low-tension batteries of improved type, and the battery feed is supplied to the receiver through a single screened multi-core cable. The receiver is slung in a new shock absorber system, and the whole installation can be removed in rather less than five minutes. The aircraft itself is used as the "earth" of the receiving system, and an aerial is fitted between the wing tips and tail, so as not to interfere with the folding of the wings.

The output leads of the receiver are connected to a very light loud-speaker movement built into the bye-pass unit, and a switch is provided for turning the wireless on or off.

Thus both occupants of the machine can converse together and can also compare any signals picked up by wireless.



A view of the test laboratory at Slough, showing the direction-finding and transmission aerials

When the pupil is considered able to make his first solo flight the instructor leaves the machine with the wireless set on. He then goes to the wireless transmitter on the aerodrome and lets the pupil "take-off" by himself. Should the instructor wish to criticise his pupil he can switch on the ground station transmitter and speak to the machine, and the pupil will hear the same orders in exactly the same voice and manner as if the instructor were still in the machine with him.

Two cases have recently occurred at one of the largest light aeroplane schools where pupils have lost their heads in landing, and have been involved in accidents, causing structural damage to their machines, and it can be asserted almost definitely that neither of these would have taken place if this wireless system had been in use. The whole of this system, including the ground station, is the result of recent developments by Graham Amplion, Ltd., the well-known wireless manufacturers of Slough.

During a flight to Manchester and back in a Moth, signals from the Croydon Station were received with this equipment, as described, right up to Manchester, at good strength. At the Heston Air Park, where the company are carrying out some of their research work, it is possible to hear machines on the air routes well over the French coast, and signals from Croydon are clearly audible, from a pair of ear-phones, at over 50 yards from the machine.

Demonstrations can be given of the apparatus in aircraft to those visiting Heston Air Park.

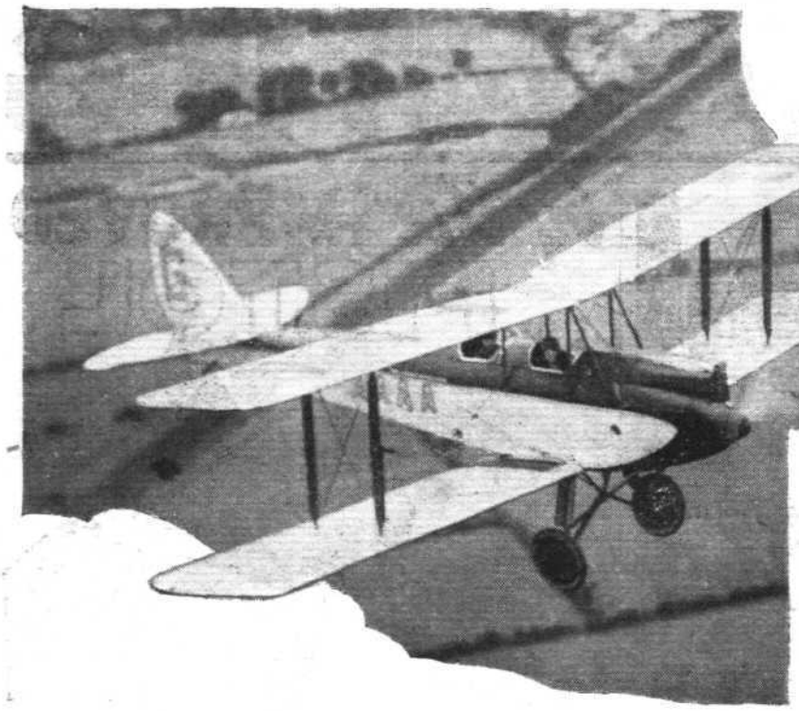
In a subsequent article the difficult problem of providing the private owner with transmission as well as reception apparatus will be discussed, as the Air Ministry are contemplating the introduction of legislation for light aircraft when fitted with wireless as the outcome of Messrs. Graham Amplion's researches.

When one considers that even 50 lbs. extra weight translated into terms of petrol may mean quite a difference in the cruising range of a light machine, one can understand the necessity for producing so microscopic an equipment. The "all-in" weight of this training equipment described is less than 20 lbs.

During some recent experiments one of the machines so fitted collided with a fence on landing, and was a complete "write-off." The wireless set was found, on trial, to be undamaged in any way, so that one need have no fears as to its reliability.

Alfred Graham & Co. are also showing their foresight by installing what will be the first wireless broadcasting station at Heston Air Park. This station, besides catering for the needs of instructors of Airwork, Ltd., while instructing pupils, will also broadcast weather reports at stated intervals, so that private owners who have the requisite receiving set in their machines will no longer be dependent upon the tele hone for these reports.

This station will be formally opened by Sir Sefton Brancker



1929

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GIVE GENEROUSLY FOR YOUR POPPY

NOV 11th REMEMBRANCE DAY

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Second - MOTH Fourth - MOTH
Third - MOTH Fifth - MOTH

SIDDELEY TROPHY TOUR
First - MOTH Fourth - MOTH
Second - MOTH Fifth - MOTH
Third - MOTH Sixth - MOTH

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GROSVENOR CHALLENGE CUP
First - MOTH Second - MOTH

AIR LEAGUE CHALLENGE CUP
First - MOTH

S.B.A.C. CHALLENGE CUP
First - MOTH Second - MOTH

HOLLAND

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Speed Contest, First - MOTH
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Sterling Tower
372 Bay Street, Toronto 2
Canada
Telegrams: Moth, Toronto

on November 7, and the installation will be described at a later date.

A wireless fan member of the staff of FLIGHT, having made certain adjustments to his set (installed at Barnes), proceeded to make a test last Saturday afternoon. Whilst going round the dial to find something out on the ether, he suddenly heard the following: "Hello, C. Y.! Hello, C. Y.! This is Heston calling. I hope you are getting this O.K. One, two, three, four, five, six, seven, eight, nine, ten—ten, eight, seven, six, five, four, three, two, one." It came through clear and strong, with good modulation. Unfortunately, our listener was unable to locate the wavelength (the set not yet being calibrated), but it appeared to be in the neighbourhood of 400 m.

Then, "Hello, C. Y.! Heston calling. A machine (registration letters given, but forgotten) is now taking off. Can you hear it?" And sure enough, the sound of the engine came through quite clearly. "Hello, C. Y.! Now there is a machine passing overhead. Can you hear that?" This also came over well. "Hello, C. Y.! Heston calling. I will now close down, as I expect you will be at Stag Lane by now. If you want me to call you on your return, will you let me know over the land line?" And Heston closed down.

Type G.A.1 Equipment

This comprises a direction-finding receiver "A," control box "B," and transmitter "C."

The receiver consists of the Bellini-Tozi system, followed by two high-frequency amplifiers, detector, and one low frequency. Weight is about 6 lbs., dimensions 4½ in. × 5½ in. × 13 in.

The control box, which is arranged to provide intercommunication between the pilot and his mechanic, with or without the transmitter and receiver working, and also to passengers in the cabin, if necessary, is 6 in. × 3 in. × 2 in., and weighs about ½ lb.

The transmitter is arranged for C.W., I.C.W., or telephony, with a range of about 150 miles on telephony. The total weight of this equipment, including the D.P. generator (not shown), is about 65 lbs. The transmitter is arranged to work on 600, 900, or 1,500 metres.

The top view of the receiver shows the method of screening the valves.

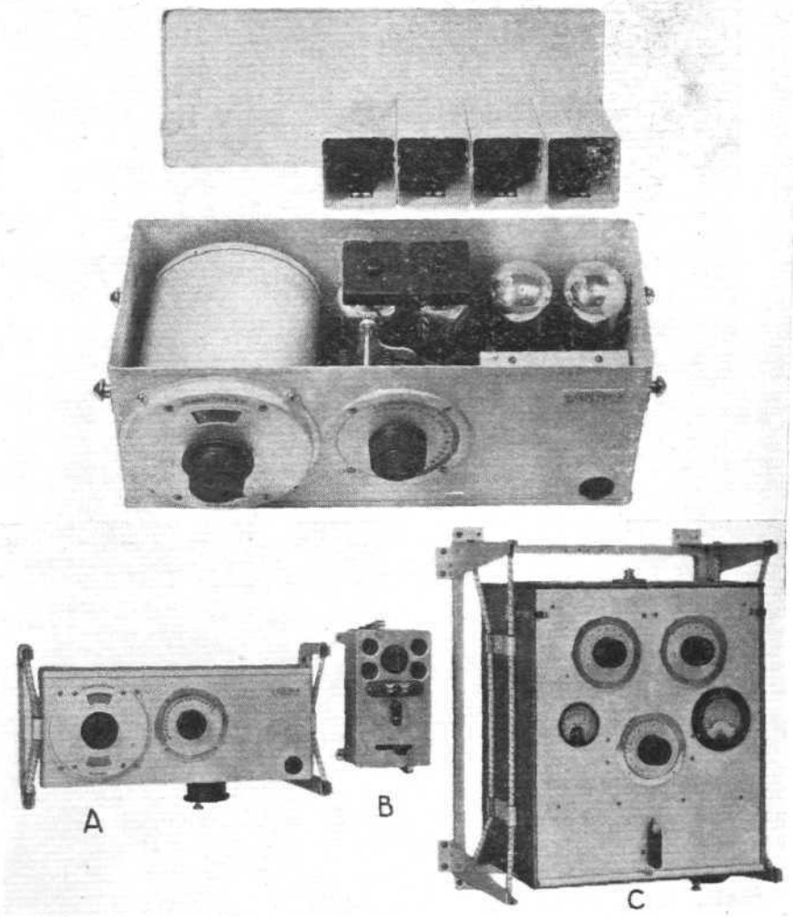
This type of equipment has been designed for aircraft operating chiefly on airways, but should appeal to private owners who run a large machine where long journeys are made. Its range should cover all normal requirements on a standard airway, and it has the great advantage that it enables the crew to determine both their actual position and bearing from any wireless station within range at the time.

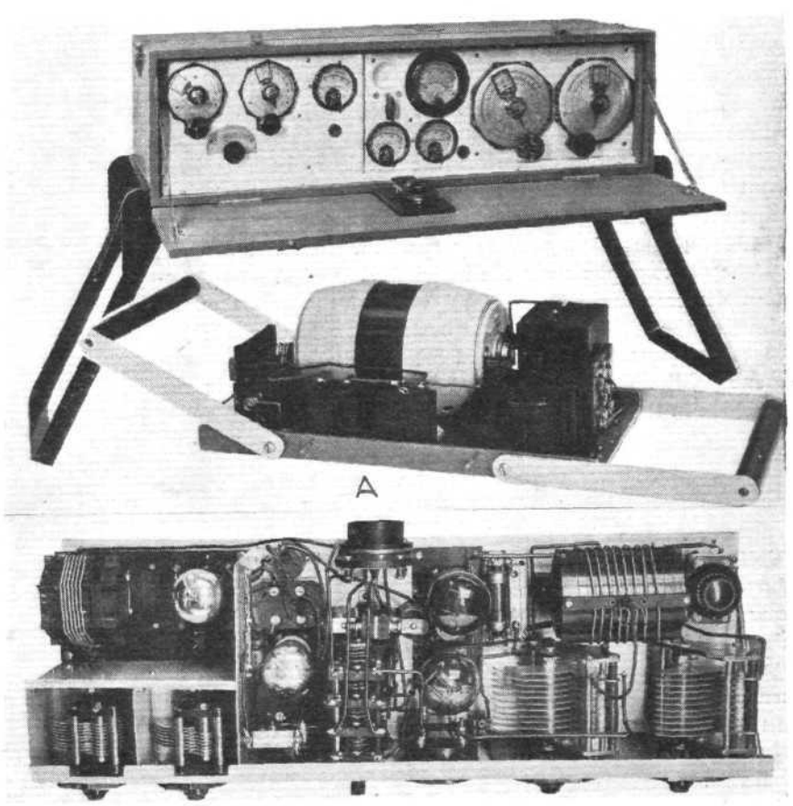
Type G.A.3 Equipment

THIS comprises a portable short-wave intercommunication transmitter and receiver for use on wavelengths between 20 and 100 metres. The transmitter consists of a 60-watt C.W. transmitter. The supply voltages, being obtained from a generator "A," run from a 12-volt accumulator. The weight of the transmitter and receiver combined is about 25 lbs. Dimensions are 8 in. × 7 in. × 24 in. The weight of the generator unit is about 25 lbs.

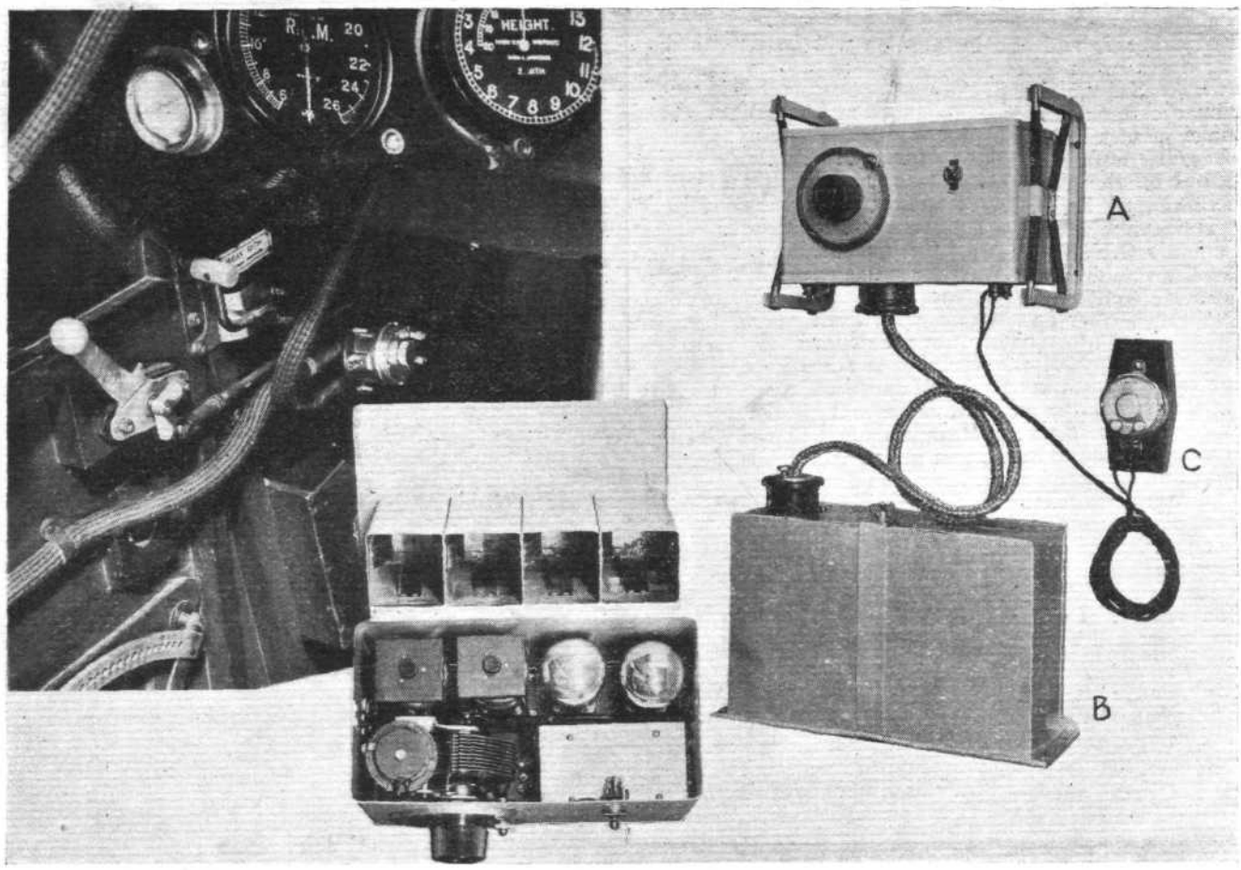
Three photographs show the combined transmitter and receiver unit, external view, internal view of the same, and a view of the generator "A" unit with the cable removed.

This outfit is only indirectly of interest to the private owner. It is, however, of very great interest to the operator of aircraft abroad, where large tracts of country have to be covered, and where the aircraft may have to operate at some distance from its base, such work as, for instance, the execution of a survey would benefit enormously by having this outfit, with which the ground staff would be able to keep in touch with the aircraft, and also with other ground stations.





Above, Type G.A.1; below, Type G.A.3.



Type G.A.6.

Another sphere in which it would be of use would be on oil fields of the exploration type, where small wells are rapidly put down, and the rig is then transported to the next site, making the erection of permanent telephone systems impossible.

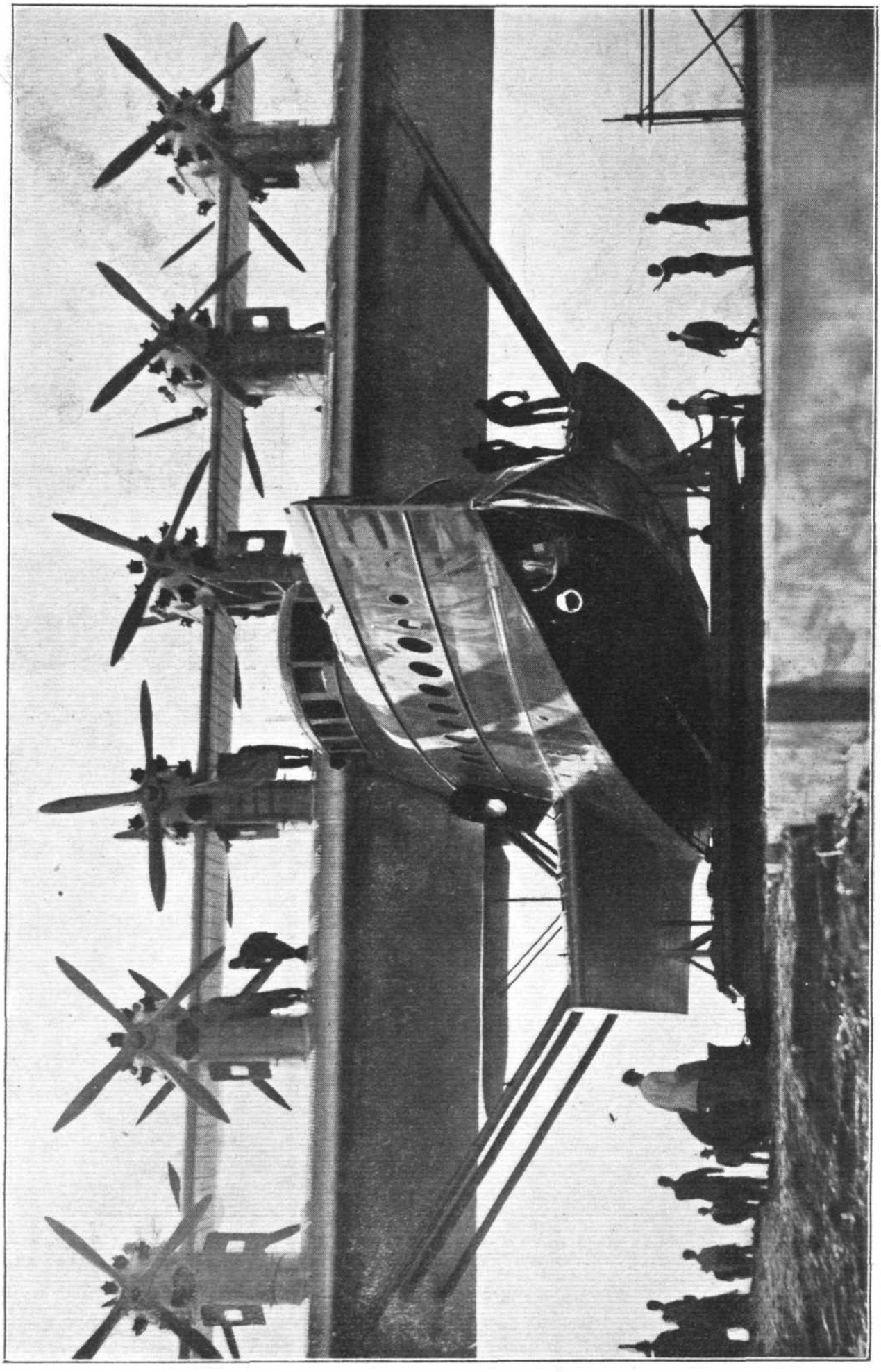
Type G.A.6 Equipment

A light-weight receiver for use on private aeroplanes, particularly on school machines for training purposes. One-knob tuning is provided, with a locking device to lock the dial at the definite wavelength. Wavelength range is 600 to 1,000; weight is 4½ lbs. (receiver unit); dimensions of receiver, 8½ in. × 4½ in. × 5 in.

The entire outfit comprises the receiver, battery box, containing high-tension unspillable accumulator, and voice-pipe attachment. The total weight of the entire equipment is 18 lbs.; dimensions of battery box, 7 in. × 4 in. × 11 in.

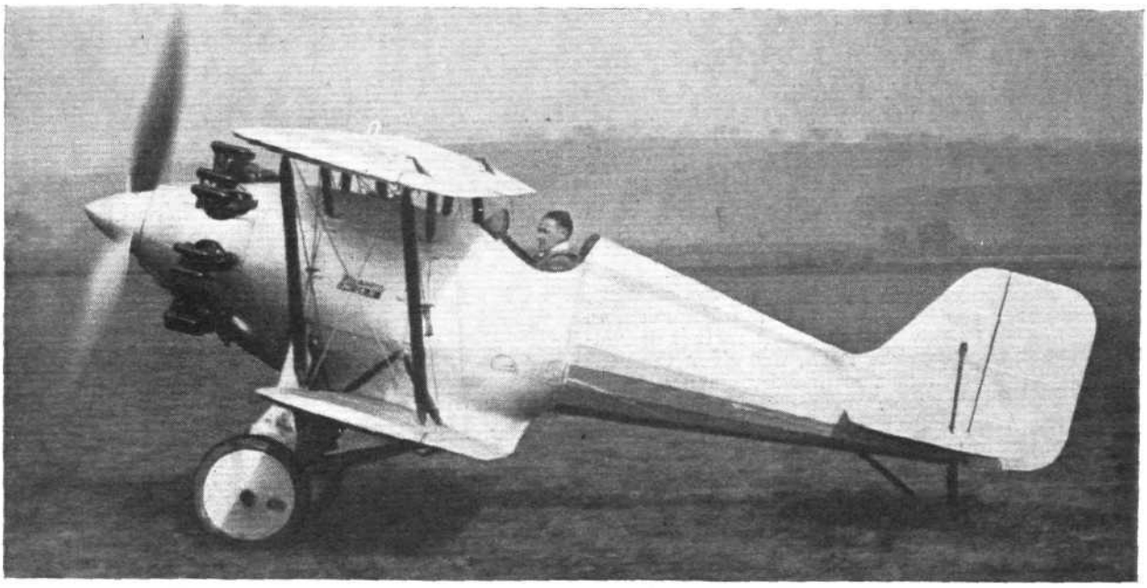
The photographs show the internal view of the construction of screening. An external view of the entire outfit, showing the receiver "A" and battery box "B," connected together by means of a screened cable and voice-pipe attachment "C," which is also shown in its fixed position in the machine in the left-hand photograph.

THE LATEST IN FLYING FASHIONS: Mrs. Eric Lovell, one of the D.H. Flying School pupils, caught by our photographer at Stag Lane Aerodrome last Saturday. Mrs. Lovell disabuses, most thoroughly, the general idea that women when flying must look unattractive, and cannot wear dainty clothes. Could anything be more becoming than her fur-trimmed flying suit with its lightning fasteners and fur-lined helmet to match? She has, moreover, proved that daintiness can go hand in hand with ability, by going solo in 14 hours. (FLIGHT *Photo.*)



Dornier Flying Ship Do. X fitted with 12/525 h.p. Siemens-Jupiter Engines.

THE NEW ALL-METAL "LINCOCK"



THE latest version of this fascinating little machine has just been put through its first test flights, which have been very satisfactory, by Capt. Blake (seen above), and in its new form it looks a picture of efficiency.

The fuselage is made in three detachable units—engine mounting, centre portion, and rear fuselage. The engine mounting is built up from duralumin plate, while the fuselage consists of four steel-tube longerons with rigid steel-tube bracing. The bracing strut joints are fixed with bolts through the longerons and tubular rivets through the struts.

The wings are also of all-metal construction with spars built up from high-tension steel strip sections and duralumin ribs. The tail units are normal monoplane type and of the same construction as the wings. The chassis, which, as can be seen from the photo, is the divided axle type, and is arranged so that the bottom planes can be removed without in any way disturbing the oleo pneumatic spring leg. The tail skid is sprung with a helical spring inside the stern-post, and brakes are fitted to the wheels.

Built primarily as an economical single-seat fighter, the Lincock has ample provision for full-service equipment, including two fixed machine guns and wireless gear, and in spite of its small size, the cockpit is very roomy and comfortable.

The engine fitted to this model is the geared Lynx (225 h.p.), but any model of this engine can be fitted. The fuel supply is arranged with gravity feed and is carried in two tanks,

one in the centre section of the top wing and the other in the fuselage, with the oil tank close to it, and both these latter are behind the fireproof bulkhead.

Dimensions :—Span, 22 ft. 6 in. (6·8 m.); length, 19 ft. 6 in. (5·9 m.); height, 7 ft. 10 in. (2·38 m.); chord, 4 ft. (1·2 m.); wing area, 170 sq. ft. (15·7 sq. m.); gross weight, 2,000 lbs. (907 kgs.); total load, 700 lbs. (317·5 kgs.).

Estimated performance :—Top speed, 155 m.p.h. (249 kms./hr); cruising speed, 130 m.p.h. (209 kms./hr.); landing speed, 60 m.p.h. (96·5 kms./hr.); initial climb, 1,450 ft./min. (442 m./min); service ceiling, 20,000 ft. (6,100 m.); absolute ceiling, 22,000 ft. (6,710 m.); range, 390 miles (627 kms.); wing loading, 11·3 lbs./sq. ft. (55 kgs./sq. m.); power loading, 8·9 lbs./h.p. (3·85 kgs./h.p.).

AIRISMS FROM THE FOUR WINDS

R.A.F. Display at Constantinople

THIRTY aircraft from H.M. Aircraft Carrier *Courageous* gave a flying display over Constantinople on October 18, which greatly impressed the inhabitants. The display, which was organised by Capt. H. S. Brownrigg and Wing-Com. R. Collishaw, commenced at 10 a.m. with the machines flying over Galata Tower in three formations, comprising nine Blackburn "Darts" (470 h.p. Napier "Lion"), nine Fairey III F (470 h.p. Napier "Lion"), and 12 Fairey "Flycatchers" (330 h.p. Siddeley "Jaguar"). At the conclusion of the display 15 machines formed the crescent, and one machine represented the star of the Turkish flag, and in this formation flew over the city. A further demonstration, from the aircraft carrier itself, was given the next day, a number of Turkish officers and foreign naval and military attachés being present.

A Trans-Pacific Airship Service

WITH the object of operating an airship service between California and Hawaii, across the Pacific, the Pacific Zeppelin Transport Co. has been incorporated in Delaware. The company has the backing of Grayson, M. P. Murphy & Co., Lehman Bros., and W. A. Harriman and Co., bankers, and the Goodyear Zeppelin Corporation of America. The latter company will proceed with the construction of two airships for this service as soon as the two Navy airships now constructing are completed. The service will eventually be extended to the Philippines and Japan.

"Graf Zeppelin"

THE "Graf Zeppelin" has made yet another cruise. Leaving Friedrichshafen on the morning of October 23, the airship flew to Barcelona, arriving there at 3.30 p.m., and circled over the city and International Exhibition grounds for over an hour. The airship then returned to Friedrichshafen after having been in the air some 31 hours.

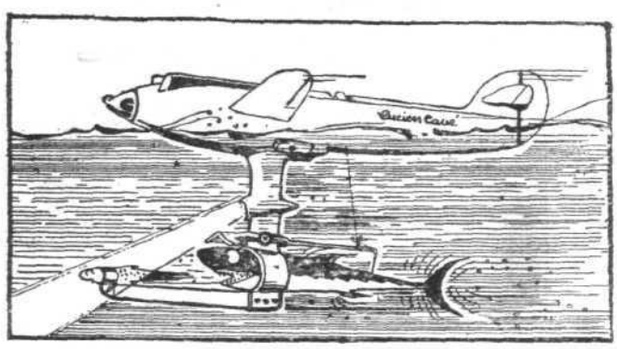
Costes and Bellonte

CAPTS. COSTES and BELLONTE, the French airmen, who recently established a world's record non-stop flight from Le Bourget to Manchuria, flew from Mukden to Shanghai on October 21. Costes intended to continue to Hanoi and then fly non-stop to Karachi (4,000 miles), and thence to Le Bourget. The French Government has awarded the two airmen £8,000 for their record flight.

R.101: A snap of the British Airship R.101 passing over the works of the British Thomson-Houston Co., Ltd., at Rugby, when the airship made its cruise over the Midlands on October 18.

Polish Altitude Record

THE Polish airman Zwirko is reported to have established, on October 17, a new altitude record for two-seater light aeroplanes, by climbing to a height of 4,500 m. (14,765 ft.) in a machine fitted with a 40 h.p. engine.



THE PIAGGIO MYSTERY SOLVED? In our issue of October 25, we published an illustration of the Piaggio P.7 Schneider seaplane, in which the fuselage acts as the main float. Our French contemporary "Les Ailes" solves the problem, in the above sketch, of how this machine takes off.

Dorniers for America

THE Dornier Corporation of America has been incorporated in Delaware by the General Motors Corporation and the Fokker Aircraft Corporation to manufacture flying-boats according to the patents and designs of the German company of the same name.

Land of the Soviets

THE Russian aeroplane, *Land of the Soviets*, is making further progress in the flight from Moscow to New York. On October 19 she reached Oakland, California, and last week arrived at Salt Lake City.

Russian Airman Over the Pamir Range

THE Russian airman Baranoff has succeeded in flying over the Pamir mountains, which are 17,000 ft. high.

French Air Minister's Moroccan Tour

M. LAURENT EYNAC, the French Air Minister, has completed his aerial tour of inspection of the Moroccan flying services, and has returned to France.

The Mediterranean Air-Mail Disaster.

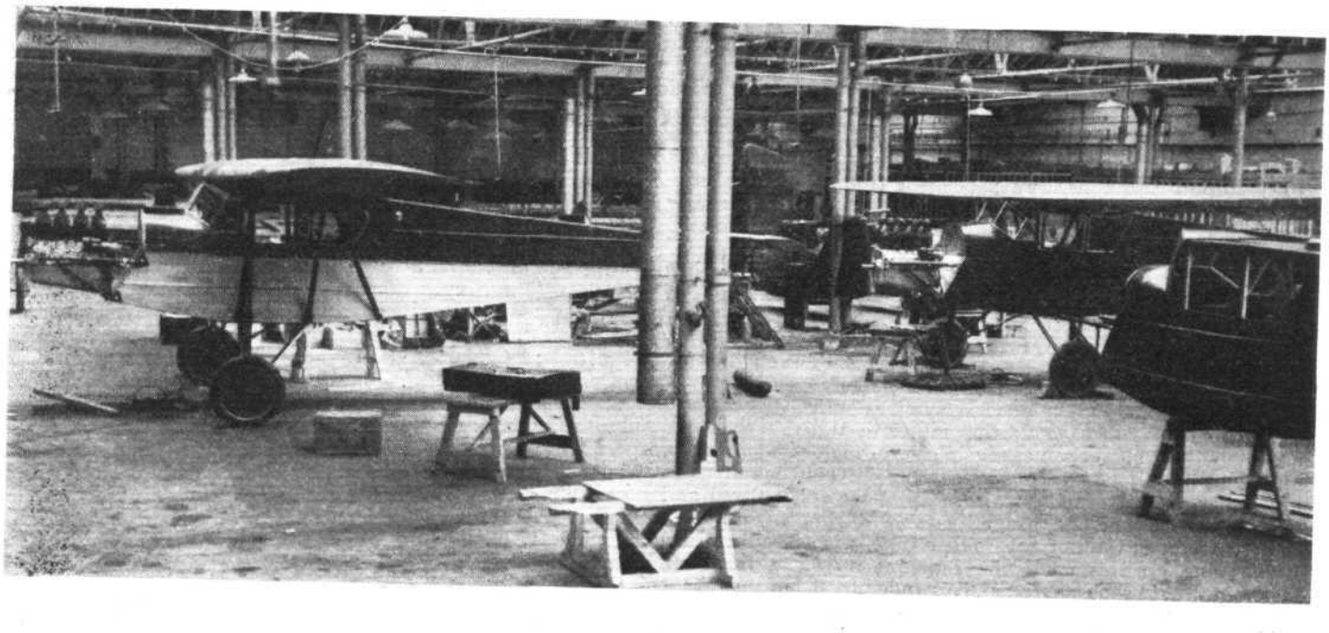
ONE of the Calcutta flying-boats, the *City of Rome*, running on the Alexandria-Genoa Imperial Airways route, was lost about 10 miles south-west of Spezia on Saturday, October 26. It appears that heavy weather caused her to come down, and she subsequently sank with the loss of all hands. Seven people were on board, including the pilot, Capt. L. S. Birt, the flight engineer wireless operator and four passengers, and up to date three of the bodies have been recovered. The wireless operator succeeded in sending out an S.O.S. before they landed, but no ship with wireless seems to have been in the vicinity. A tug, the *Famiglia*, sighted the boat and got her in tow, but the terrific seas carried away the tow-rope and the tug then lost sight of her and returned to Spezia. We deal further with this regrettable disaster in our Editorial Comment.

"Knight of the Grail."

CAPT. T. CAMPBELL BLACK, who is piloting the Avro 5, named the *Knight of the Grail*, to Kenya, for the Wilson Air Lines, has had bad luck. Three times already he has had to make forced landings. On Thursday at Meru, near Beaumont; on Friday, after resuming his flight from Le Bourget, he was again forced down at Dijon, and finally on Monday at Orbetello. On this last occasion he is reported to have sustained slight injuries, but was able to continue the flight on Tuesday.

Exhibition of Aircraft Models.

THE Royal United Services Museum, Whitehall, has just placed on view a very interesting display of model aircraft, including a range of different types from the early Wright biplane up to the present-day machine. These models will be on view until January 30 next.



A PURELY COMMERCIAL AIRCRAFT FACTORY OF THE NEW STYLE

MR. MARCEL DESOUTTER, whose English edition of the Koolhoven cabin monoplane has already been described in these columns and which has been seen at several air meetings latterly, has built up his factory with great rapidity and on modern lines.

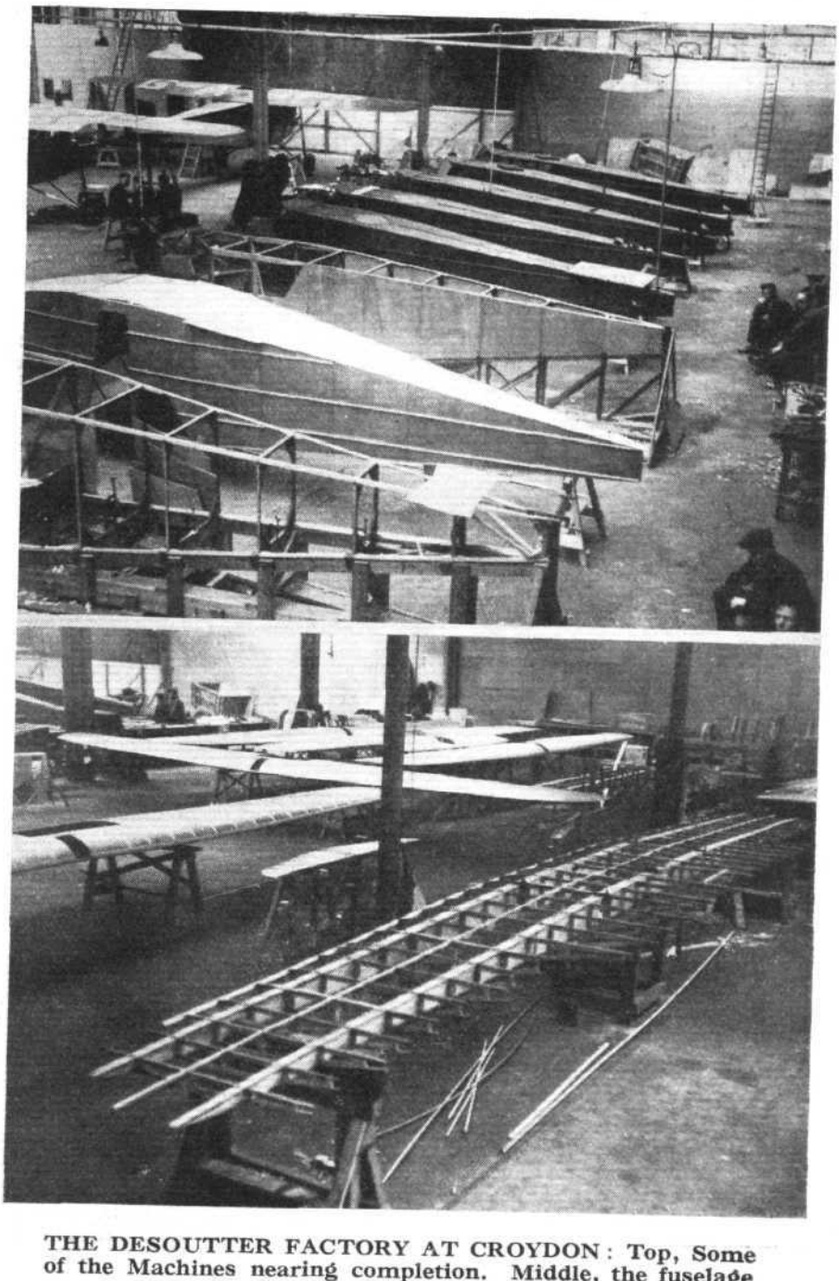
He has taken the long view and while catering for his present needs has at the same time laid things out so that rapid and economical expansion will be easy to bring about.

Our photographs show that the line system of production is already in full swing and the orders on hand, not only for N.F.S., but also for abroad will ensure regular employment for his staff for some considerable time. The overhead air piping should be noted, this allows the use, in any part of the factory, of that extremely useful little Desoutter Pneumatic Drill which can also be used for screwing in screws.

Mr. Handasyde, the works manager, has simplified all fittings and joints wherever he has been able to do so and the machine is now down to a "production job" and dealing as they do with only the one type, and not being subjected to the same changes in design which those who cater for Service requirements have to put up with, the firm should soon find themselves on a very firm basis.

In this machine they are catering for a demand which is bound to grow as more people join the ranks of private owners who will not put up with the discomfort of open machines, and being first in the field in producing this type of machine they will naturally reap the benefits.

When one considers the matter, it is really surprising that private owners have put up with the discomfort of open machines for so long. For, after all, this form of transport is sure to follow the history of all other forms, and is in fact doing so already, and just as people now want saloon cars and comfort so will they ultimately want enclosed aeroplanes.



THE DESOUTTER FACTORY AT CROYDON: Top, Some of the Machines nearing completion. Middle, the fuselage assembly line. Below, a Corner of the Plane Shop

(FLIGHT *Photos*)

MR. ANTHONY FOKKER ON A HOLIDAY

MR. FOKKER has recently been over to this country on a short holiday ; being a true disciple of the doctrine of " practise what you preach " he naturally uses an aeroplane for such a journey. On this occasion he chose one of his own latest productions, a Fokker F.IX.

It is believed that this is the first time this machine has been seen over here and a brief description will not be out of place.

This new machine is a typical Fokker in design and construction and carries 18 passengers and two pilots. The engines are three Jupiter VI's and it can take-off and fly on any two of them with full load. The pilot's cockpit is entirely closed and has an exceptionally fine all-round view, the side windows are all made to slide open easily in case of fog or bad weather, and the pilot should be as comfortable in this cockpit as in any other machine in the world. Dual control is fitted and the tail plane and fin are adjustable during flight. The undercarriage is the normal Fokker type, with Bendix wheel brakes and on this particular machine an extra large ski type of tail skid shoe was fitted, it is understood, however, that this will shortly be replaced by a tail-wheel.

The cabin is large and roomy and especially large luggage accommodation is provided ; for Mr. Fokker's use the standard seats had not been fitted, and the cabin was luxuriously equipped with chairs and tables.

The following is a brief specification of this aircraft :—

Dimensions.—Span, 88 ft. 6 in. (27 m.) ; Length, 60 ft. 8 in. (18·5 m.) ; Height, 15 ft. 11 in. (4·85 m.) ; Wing area, 1,109 sq. ft. (103 sq. m.) ; Cabin, height 6 ft. 3 in. (1·9 m.), width, 6 ft. 7 in. (2 m.), length, 16 ft. 11 in. (5·15 m.) ; Capacity of luggage compartment, 196 cub. ft. (5·55 cub. m.) ; Track, 23 ft. (7·02 m.).

Weights :—Empty, 11,791 lb. (5,350 kg.) ; Useful load, crew, 353 lb. (160 kg.), petrol (502 galls.), 3,019 lb. (1,370 kg.), oil, 330 lb. (150 kg.), pay load, 4,343 lb. (1,970 kg.), Total useful load, 8,045 lb. (3,650 kg.) ; Total weight, 19,836 lb. (9,000 kg.) ; Wing loading, 17·9 lb./sq. ft. (87·4 kg./sq. m.) ; Power loading, 13·2 lb./h.p. (6 kg./h.p.).

Speed :—Max. at 1,800 revs., 132 m.p.h. (212 km./h.) ; Cruising, 109 m.p.h. (175 km./h.) ; Stalling, 67 m.p.h. (107 km/h.).

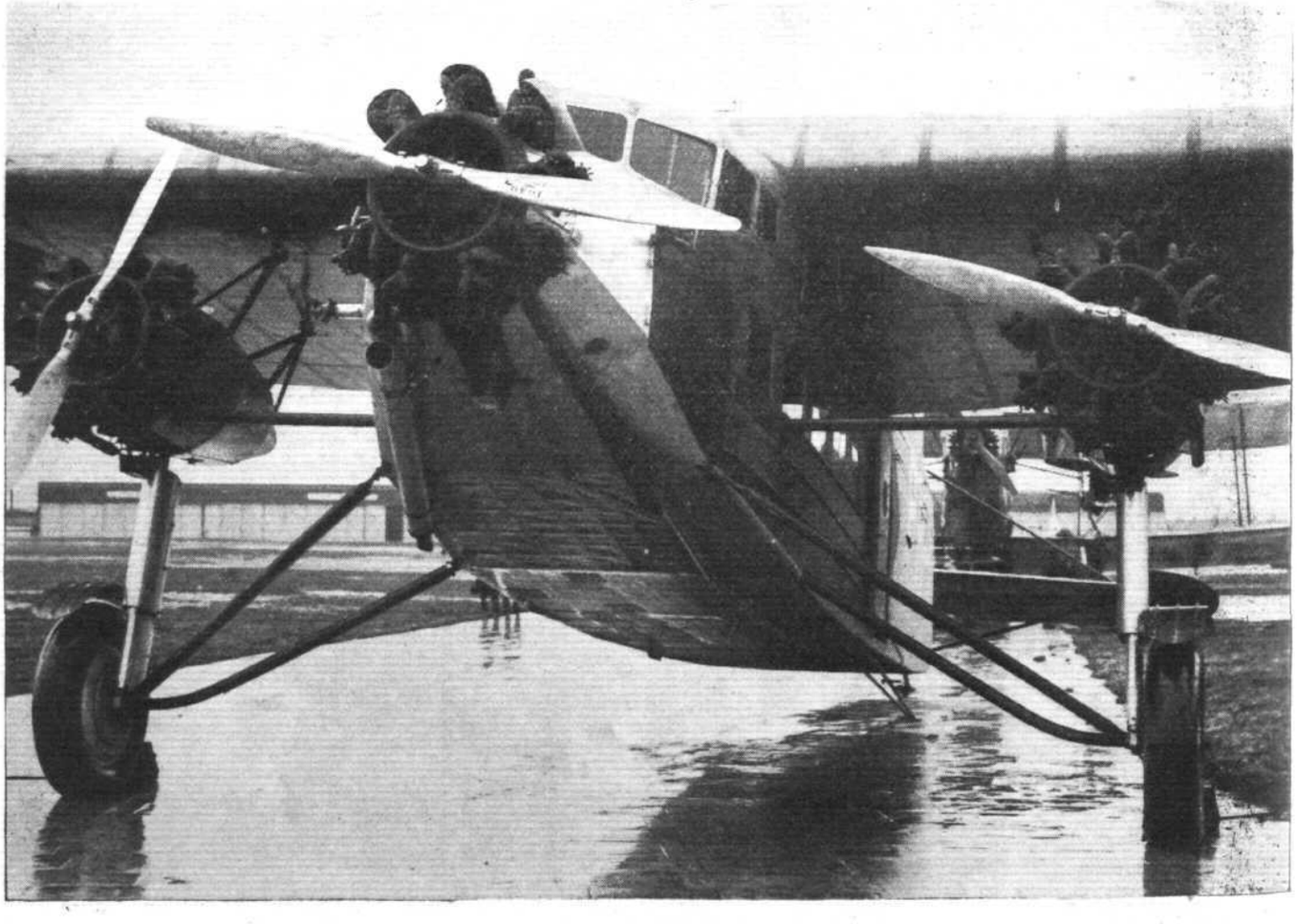
Climb to 9,852 ft. (3,000 m.), 31 min. ; Service ceiling, 12,000 ft. (3,600 m.) ; Absolute ceiling, 14,800 ft. (4,500 m.) on two engines, 4,000 ft. (1,200 m.) ; on two engines with all up weight of 17,637 lb. (8,000 kg.), 8,000 ft. (2,400 m.).

Range: 700 miles (1,100 km.).

Mr. Fokker in a jovial mood. (FLIGHT *Photo.*)

When interviewed recently, Mr. Fokker is reported as saying that he was arranging a combination of European and American interests, to make the Fokker aeroplane a world-wide organisation and to centralise and co-ordinate the sales organisation. He was, he said, also going to confer with Mr. Sloane, president of the General Motors Corporation, which has taken up 40 per cent. interest in the Fokker Co.

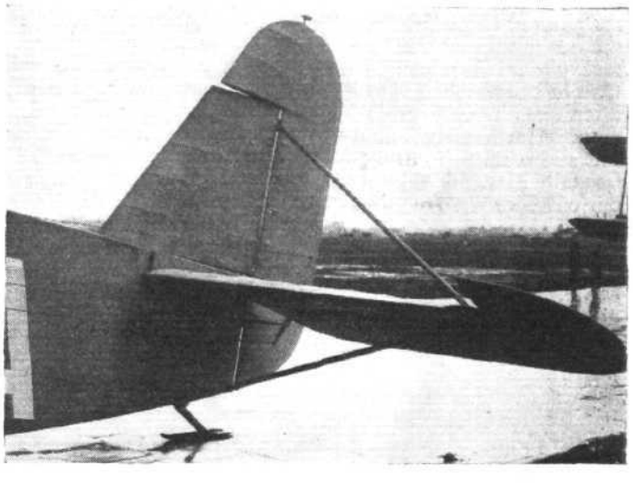
Further pictures will be found on the following page.



An external view of the " office." The cabin heating arrangement from the front engine exhaust should be noted. (FLIGHT *Photo.*)

The side view above gives a good impression of the room that there is in the cockpit. The top cylinders, it will be seen, are hooded, which should prevent any chance of the cockpit windows becoming oiled up.

On the right is a close-up view of the tail, showing the typical clean Fokker design, which is followed even in a machine of this size, and also the new ski-type of skid shoe.



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FUTURE AIR MAGNATES

SIR HENRY SEGRAVE and Sir William Morris have recently both been reported as entering the aviation industry.

The former is connected with a very large concern which has the backing of an important group of financiers and which, among other activities, proposes to run taxi services on a size that has hitherto not been possible. Sir William Morris, it is announced, will shortly give us aero engines at £1 per horse-power; it is not yet possible to disclose details but we hope to be able to do so later, and in the meantime we feel that this country can look to Sir William with gratitude for keeping us ahead of the foreshadowed cheap engine invasion from abroad.

Sir William Morris.

Sir Henry Segrave.

THE ART OF FLYING LANDPLANES AND SEAPLANES

WHEN Captain Norman Macmillan, M.C., A.F.C., became a test pilot, the Fairey Aviation Co. acquired an asset to their staff, but it is to be feared that the country as a whole lost a great writer. One began to suspect the fact when a London Daily published Macmillan's own account of his adventure in the Bay of Bengal, passages of which account were worthy of a Kipling; one was fairly certain when Macmillan published his book "The Art of Flying," and became quite convinced after reading his paper entitled "The Art of flying Landplanes and Seaplanes," which Captain Macmillan read before the Royal Aeronautical Society on October 24. Few other pilots in the world could have written that paper in that particular manner, and it is our great regret that we cannot, from considerations of space, publish the paper in full. Captain Macmillan's introductory remarks, in which he writes entertainingly of flying as one of the arts, and of the relationship between the "flyer-in-mathematical-terms-on-paper," and the practical pilot who has to work in a medium far less stable, is, under its slightly bantering tone, worthy of very close study, quite apart from the fact that its phraseology can be read again and again with sheer enjoyment.

The first part of the paper itself, in which Captain Macmillan calls attention, and is, as far as we are aware, the first to do so, to the wholly misleading "picture" which one is apt to form because of the difference in horizontal and vertical scales used in performance graphs. The fact that the speed scale is in miles per hour and the climb scale, for example, in feet per minute, causes one to form a quite exaggerated idea of the vertical velocity and of the altitudes reached by aircraft. That Captain Macmillan is entirely right we discovered for ourselves many years ago, during the war in fact, but never attached any importance to it. It was left to Captain Macmillan to point out that it *does* matter. In our case, we were looking at a map of London, and trying to get an idea of how an air raider would see it from, say, 20,000 ft. It was found that one had to hold one's eye almost *on* the paper of the map. On that scale 20,000 ft. was nothing at all. Captain Macmillan's pictorial conception of what an aircraft can accomplish was excellent, but we must perforce omit it here and confine ourselves to giving the last part of the paper as follows:

Flying divides into three distinct parts—

(1) The start or take-off;
(2) Fully air-borne flight;
(3) The alighting.

There are innumerable sub-divisions, but these are the three main features which naturally separate, like cream, milk and butter; the sub-divisions are like the many varieties of cheese. This paper is too short to consider every detailed aspect of flight and as it has to treat of seaplanes as well as landplanes, I propose to cut out the cheese.

These three parts may be classified as follows:—Nos. 1 and 3 as ground flight, No. 2 as air flight. As everyone knows, the life of the pilot is relatively short. By this I do not mean to infer that early decease follows the commencement of a career in practical aviation, although this is sometimes the case. I mean that the pilot's flying life is counted in hours, and a hundred hours represent quite a long time in the air, although terrestrially they are reckoned simply as four days. If one considers the average length of a flight to be about thirty minutes and the average time of take-off and landing at about fifteen seconds each, then the ground flight experience of the average pilot is roughtly one-sixtieth part of his air flight experience. Even allowing for the additional time devoted to ground flight in the preliminary stages, it is not likely that the hundred-hour pilot has much more than four hours of ground flight to his credit. This is why so many accidents occur near the ground to pilots who are young in air experience. They try to take to their wings too quickly, to soar upward into the skies where they can perform the satisying evolutions of aerobatics before they have mastered the elements of ground flight.

I have no hesitation in saying that fuller consideration should be given by every individual pilot under instruction to the precepts of more experienced pilots who have acquired the art of flying. There is no branch of flying in which such advice is of such real value as in ground flying, where pre-flight knowledge gleaned from individuals and books can be turned to value during the early practice hours of the young pilot. In flying, to be forewarned is to be forearmed in reality against the possible mistakes in judgment which the embryo may commit. High up, in full flight, there is time to think what to do; low down, near the ground, there is rarely time to reverse a mistake even once. By far the greatest percentage of flying accidents is ascribed to lack of judgment upon the part of the pilot, and these accidents invariably commence with a mistake perpetrated at low altitudes.

The art of flying lies in the judgment of eye, the touch of hands and feet, and the synchronisation of all to one end. The air pilot must decide what he will do, then do it, not change his mind at the last moment. The vacillating individual should not fly, if he values his life, unless he has first conquered this failing.

In the case of the aeroplane with a speed range of 55 to 150 miles per hour, I classify ground flight as from 0 m.p.h. to 75 m.p.h., and full air flight from 75 m.p.h. to 150 m.p.h. Flight at the latter speeds should normally bear no connection whatever with the ground. The pilot then should not consider the ground when in full flight at any reasonable height, although when circumstances—such as weather, high mountains—force him to fly near the ground he must regard it. The horizon, which plays an important part in the pupil's lessons, is an excellent datum line about which the instructor can display the functions and values of controls when on the turn, and from which he can direct the aeroplane's attitude to the horizontal when on the glide, but it must not be carried too far into the pupil's post training flying. Actually, I would recommend that final lessons on advanced types of aeroplanes should include flying without regarding the horizon. Of this type of flight there are several varieties—the first, the aerobatic flight of single-seaters in fighting flying; the second, formation flying in which one's aeroplane is flown in relation to another; the third, the skilled pilot's flight during which he sometimes rides the air regardless of horizon and instruments, flying solely on a sense of balance and of touch; the fourth, the horizonless flight of the test pilot and the pilot flying blind, both of whom must fly by instruments.

The horizonless aspect of flight is very important in the early stages of ground flight, because the glide to the landing on strange aerodromes may bring the nose of the aeroplane below a false horizon, such as a belt of trees or a range of hills, or a bank of clouds or mist, and throw the inexperienced pilot's judgment out, while on a prolonged glide the whole aspect of the earth's surface can make an apparent change of angle, the ground appearing to tilt up as one approaches, so that the horizon appears relatively higher, which can very readily induce instinctive deceleration quite low down with a consequent possibility of stalling at low heights.

Again, modern streamlines and wing sections have so diminished head resistance and increased lift that sometimes the nose of the aeroplane actually rises above the horizon upon the slow glide, when too rigid an adherence to the principle of nose so much below the horizon will make the inexperienced pupil approach the landing with greatly excessive speed, when the optical change of the angle of the earth's surface will add still more to his confusion as to what he must do with his surplus velocity.

I shall now pass to a more particularised study of the flying of landplanes in general.

Take-off

This, the period of transition from rest to air-borne flight, should never be treated with carelessness. The pilot should always be conscious that he is performing an act which requires great concentration. Many pilots, accustomed to taking-off hundreds or perhaps thousands of times affect an attitude of indifference to the act of acceleration to flying speed. It becomes instinctive. Now, no matter how accustomed one has become to the act of taking-off, the few seconds which are entailed in this process should always be considered worthy of the deepest attention. Wind direction, the position of all aeroplanes flying in the neighbourhood, any obstructions ahead of the clear stretch of aerodrome, should all be noted, together with the instrument readings which matter—oil pressure and fuel pressure or gauge should always be glanced at just before opening the throttle after taxying out into wind; the setting of the adjustment for the tail should also be verified. It is understood that the pilot has already satisfied himself that the engine is functioning correctly on the tarmac. The attitude of the aeroplane when standing on the ground should be mentally noted because that indicates something of the stick position required to raise the tail when the engine is first opened out; it also provides the pilot with the exact position which the aeroplane must be compelled to adopt at the precise moment of alighting to make a three-point landing—the aim of the pilot who prides himself upon his landings. It ought also to be the aim of the designer who prides himself upon his skill that the aeroplanes he turns out do make their slowest possible landings when at the three-point angle. This is a matter which concerns the correlation of fuselage angle, wing angle to fuselage, wing section, tail weight, tail volume and elevator volume. It is not the easiest part of a designer's life to so adjust the varying requirements of a new type that they will enable even the relative skill of different pilots to be accommodated so as to achieve a common verdict that the new machine is an easy one to land. It is sometimes true that the pilot is blamed when the designer is the culprit.

Before taking off, the compass direction of the wind upon the ground should be noted as a mental record of the wind direction on the ground, which may not be the same as that of the geostrophic wind. Drift readings of the latter, while necessary for the keeping of correct compass courses when flying above 1,500 ft., do not indicate the ground wind direction which should never be unknown to the pilot because the sudden need for a forced landing may not give him time to find it out and thus augment the difficulty of making a safe alighting.

Always before going into the air and without any exception the pilot should note that all his controls move in the correct direction and to the full extent of their travel.

The characteristics of aeroplanes vary in the take-off, but to a less degree than in the alighting. Apart from the obvious effects of changes of load and centre of gravity, the main causes of differentiation which affect the pilot are the following: Airscrew characteristics, tail skid load and tail plane and elevator volumes, wheel resistance and head resistance, and wing section. I have placed these factors in the order in which they affect the take-off.

Let me dwell briefly upon them one at a time.

Airscrew; the design of the airscrew plays a most important part in the ease of take-off. Immediate acceleration can be obtained by a suitable airscrew, in the production of which the engine gear ratio and revolutions play an important part. One cannot hope for rapid take-off from a direct drive high-revving airscrew which may be stalled until a forward speed of something like 40 m.p.h. is reached; with this type of airscrew one can feel the instant increase in acceleration which denotes the passing of the critical point; best take-off is obtained by forcing the tail up as quickly as the thrust will lift it until the fuselage reaches the angle of minimum resistance to the forward passage of the aeroplane; in this way the poor thrust is utilised to the best advantage; sometimes initial acceleration with this type of airscrew is best achieved by deliberately not opening the throttle to the maximum until the forward speed is considerable. There is not much that the pilot can do with defective airscrew design other than this, and the problem, when it arises, must be dealt with by the designer of airscrew and perhaps of engine.

Tail skid load and tail surface volumes. Here the matter is quite straightforward. If the pilot is unable to lift the tail skid from the ground as soon as he opens the throttle the additional drag lengthens the accelerating run. In this case the pilot should have the stick hard against the forward stop before he opens the throttle and should always take-off on a down gradient if that is possible. The remedy is again one of design.

Wheel resistance produces a dual problem, one of slow speed and one of high speed. On soft ground, when the wheels tend to bog, the tail must be kept low to reduce the load on the wheels and to make the aeroplane less likely to tip upon its nose and damage the airscrew; with increasing speed, however, the tail must be allowed to rise for two reasons; first, to reduce head resistance which becomes more and more important as speed rises; and second to enable the pilot to assume effective elevator control should the aeroplane run over patchy round of varying degrees of softness.

Wing sections make a difference to the take-off control required by the pilot. The thin wing with a critical stall is generally best handled by being forced to assume the attitude of minimum head resistance throughout the complete take-off run, and held there until minimum flying speed is actually exceeded, when the well-designed aeroplane will fly herself off. Length of run and other considerations may call for slightly different handling in special cases. The thick wing, when not too heavily loaded, can be eased to a

decided positive angle while running along the ground, and this will be found to reduce the length of run considerably, by reason of the reduction of wheel resistance which accompanies the proportion of lift taken by this type of wing at speeds below flying speed. With very high loadings, when the speed range is limited and the climbing angle is low, the take-off calls for very great skill upon the part of the pilot. It may well be that a variation of more than two degrees on either side of a definite angle of best lift/drag ratio will prevent the aeroplane from taking off at all; in this case, no oscillation to feel the aeroplane off the ground is permissible; the correct take-off attitude must be assumed as quickly as possible, and maintained scrupulously throughout the run.

When the thrust obtainable is high, as on aeroplanes of light power loading, the question of take-off is easy, and may be one solely of counteracting the effects of torque and slipstream by means of aileron and rudder, actions which soon become automatic in a pilot's life.

When the pilot's view makes it feasible I advocate sitting centrally in the aeroplane and facing and looking dead ahead. Any other attitude tends to make the pilot take-off slightly out of the straight course, or with one wing slightly down.

Throughout the take-off run, and during the initial part of the climb, it is very necessary to listen attentively to the engine. There is no more dangerous situation in the air than that when the engine cuts out dead, after having taken off, and risen a few feet into the air. If there is any change of note from the engine, the pilot should immediately reduce his angle of attack in readiness for a complete engine stoppage, and the need to assume a gliding attitude to prevent a stall. The advice never to turn back under such circumstances is very sound, because the judgment required to do so successfully must be superfine.

Air-borne Flight

Fully air-borne flight is easy, infinitely easier than the driving of a motor car. There is little to add to what has already been indicated earlier in this paper about the discrepancy which exists between indicated speeds and actual speeds. With regard to height, there are two sources of error which may arise in the pilot's computation of his height. The first is the need to know the height above sea level over which he flies in relation to that from which he started and at which, presumably, he set his altimeter to zero. This information can be obtained by determination of one's position on the map and the reading of the heights given thereon. A second more serious source of error is that caused by the horizontal variation of atmospheric pressure, which affects the reading of the altimeter. The only means the pilot has of determining this is by studying the weather chart and its tendencies over the route upon which he is going to fly. One millibar is equal to 30 ft., and a deep depression could produce a variation of as much as 1,000 ft. in the reading of the altimeter, in which case, the pilot would be flying, instrumentally, 1,000 ft. higher than his true height.

In fully air-borne flight, the worst predicament in which the pilot can find himself is the spin, and of spins, the worst variety is the inverted spin, in which the accelerations on the aeroplane are acting to eject the pilot from his cockpit. Fortunately, modern design has reduced the danger of spinning to a very great extent. The spin always follows the stall, and the character of the stall has been very materially altered in recent years by the adoption of the Handley Page slot. The aeroplane fitted with the slot is much more difficult to stall, and consequently more difficult to spin. The slot does not eliminate the spin, but it makes it almost impossible to spin involuntarily, for all three controls must be applied to the maximum to produce the spin when the aeroplane is in a stalled condition; that this could happen involuntarily is very improbable. The slot, furthermore reduces the speed of rotation when in the spin, and makes the recovery more rapid. These remarks relate to the effect of the slot in the normal spin. I do not know precisely what the effect of the slot is in the inverted spin, nor have I ever met anyone who has been able to tell me, but it would appear that in the inverted spin, the slot will not have the same effect, and that it may not have any effect until the aeroplane is well through the manœuvre of recovery and restoration to normal airflows and accelerations has been achieved by the pilot. In the normal spin, however, I have found on one machine that aileron control alone was sufficient to bring the aeroplane from the spin condition into the spiral, and this I have never found on any aeroplane not fitted with slots. Just as every motor car is better when fitted with four-wheel brakes, so is every aeroplane better when fitted with slots. Nevertheless, every pilot should know how to spin and how to recover from both the normal and the inverted spin, so that in emergency he can act without hesitation.

Alighting

The alighting must be divided into two parts; first, the approach, and second, the actual alighting. The approach is the more difficult. It must be varied according to the characteristics of the particular aeroplane, and to meet the conditions encountered; these are, wind, ground over which the approach has to be made, and the size and shape of the aerodrome and the obstructions which lie about its periphery. Generally speaking, it is always better to overshoot in the approach than to undershoot. The latter involves the use of engine, which instantly changes the wing angle of attack, and the angle of glide, and makes the actual alighting more difficult to accomplish neatly, whereas the former fault can readily be cured by the use of the sideslip, which has the advantage of improving the view of the landing field. The method of making the approach will vary with the conditions under which it has to be made; sometimes the glide can be made downwind, finishing with a 180-deg. turn into wind; this is the favourite method of alighting of the common crow, who accomplishes such landings with the ease of a finished artist; the swan, however, heavily laden and clumsy, always approaches with great care and exactness, obviously afraid of damaging himself by a clumsy landing on the water; I have never seen a swan alight on land. A very great deal can be learned about methods of approach from a study of the ways and means adopted by the different birds, and I would counsel all students of the art of flying to profit by the simple means of observation, not only of birds, but by observing the landings of aeroplanes, particularly in regard to the approach.

The alighting is a simple matter if the approach has been properly made. If the approach is made too slowly, particularly with a heavy aeroplane, the pilot may find it difficult to get the tail down; there may be an observable tendency for the aeroplane to glide into the ground. The reason for this is simple. The changing of the aeroplane's attitude from the glide to the three-point absorbs a certain amount of energy. That energy is supplied by the moment resulting from the upward movement of the elevator. The absorption of this energy causes the aeroplane to slow down. If, however, the aeroplane has previously been slowed to the point of stalling the surplus energy does not exist to provide the moment, and the aeroplane simply does not flatten out. The speed required in excess of the stalling speed for different aeroplanes can soon be found in practice, and the pilot flying a strange type for the first time can assess the best speed by flying very slowly at a reasonable height and finding the effect of the elevator upon the pitching movement of the aeroplane. This detail must not be confused with longitudinal instability, for the longitudinally unstable aeroplane may quite possibly be easier to land from a slow approach speed than the stable aeroplane, although the required stick movement then becomes extremely critical. This can readily be proved by testing landings with a stable aeroplane loaded well aft, so that the shift of the centre of gravity produces a less positive restoring moment from the tail surfaces.

Landing is always best accomplished by looking well ahead of the aeroplane. Looking close ahead upsets the time factor and makes landing more difficult to carry out consistently.

Seaplanes

The last part of this paper has to treat of the flying of seaplanes. So far I have used the term aeroplane throughout, because most of the matter has been applicable to both land and sea planes. In the air the seaplane can be considered in the same way as an aeroplane. It is somewhat more clumsy, its speed range is usually less, and its manœuvrability somewhat poorer. In other respects its behaviour is similar. Any pilot who can fly an aeroplane can fly a seaplane in the air. The real difference between the types arises on the water, and the pilot who has experience of the water handling of yachts or motor-boats will not find the water handling of seaplanes so difficult as the pilot who has no such experience. The seaplane, however, has this disadvantage on the water—it has no keel, and consequently is more subject to drift and to list, especially since there is no means of reducing the large expanse of wing surface exposed to the wind. The monoplane, particularly the low-wing monoplane, with its reduced side surface compared with the biplane, and its lower vertical centre of gravity compared with the high wing monoplane, is the least subject to the effects of wind, and, therefore, other things being equal, the best type, and the easiest for the pilot to handle.

It is in the crab-wise movement on the water due to the alignment of the seaplane necessary to accommodate the triple forces of wind and water and airscrew thrust that the seaplane is most distinct as against the landplane, and the judgment required of the seaplane pilot to offset the effects of wind and tide is a speciality of his own, of which he is justly rather proud. Nor is it something which can readily be acquired from books. It requires practice, and, above all, common sense.

The take-off of a seaplane is different to that of a landplane. The water forces of the floats or hull are quite different to those of the wheels of a landplane; perhaps the nearest approach that the landplane pilot ever gets to the take-off of a seaplane occurs when he is forced to fly from very sticky ground on which his wheels alternately stick and free. The seaplane pilot must hold the nose of the seaplane well up when he first opens the throttle to cause the water to break as far aft as possible and so keep the airscrew as free as possible from spray. This critical point is usually passed fairly quickly, and at about 15 to 20 knots the seaplane rides out from the partly displacement supported condition to the hydroplaning condition. At this point there is frequently a change of stick position from aft to forward, and if thrust horse-power is low the crossing of the hump, as this is called, may well require very great skill to accomplish.

Once the seaplane commences to hydroplane acceleration is rapid because the water resistance falls immediately. Towards the end of the hydroplaning run it builds up again, and the thrust available again becomes very important. The pilot can do a great deal to assist the take-off by forcing the floats to adopt the angle of minimum resistance through correct use of the elevator. In some seaplanes which I have flown this angle was so critical that failure to reach and maintain it meant failure to take-off. To-day, however, float design and engine development have reached a stage which has rendered the take-off infinitely easier than it was in past years. In rough weather the skilled seaplane pilot carefully watches the run of the sea and chooses the moment to open the throttle with a view to crossing the critical, dirty period before the hydroplaning point in the smoothest possible water. In rough water it pays to get the seaplane into the air with the minimum run, but the pilot must be careful that he does not get thrown clear of the water before he has reached flying speed, otherwise he might fall back, stalled, into the trough of a sea and suffer serious damage.

The alighting of a seaplane does not present problems materially different to those which accompany the alighting of an aeroplane. On smooth water there is no difference between the landing of a seaplane and the landing of a landplane on land, except that it may be more difficult to judge height above the surface of the sea. In rough weather the matter is different. Then the seaplane pilot has to alight on a surface the state of which would appal the average landplane pilot. The seaplane pilot must come down on to the water with the minimum forward speed, touch ever so slowly just on the crest of a wave. Misjudgment will cause the seaplane to fall into the trough, when the next wave will sweep the seaplane and do damage. Alighting too early upon the wave crest will send the seaplane upward high into the air to fall heavily in a stalled condition into the turmoil of the sea and possible wrecking by the waves. The seaplane pilot is fully justified in taking pride in the skill which he displays in handling, for sea work, a relatively clumsy apparatus on the water.

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Aircraft Classes

THE Middlesex Higher Education Sub-Committee have approved of the establishment of classes in connection with the aircraft industry at the de Havilland Aircraft Company's aerodrome, Edgware. Tuition will be given in aircraft and aero-engine construction, aeronautical design and applied mechanics. The students will be prepared for the Air Ministry's Examinations and the Associate Membership of the Royal Aeronautical Society. The company are providing two suitably furnished lecture rooms, a fully equipped workshop, and all the necessary apparatus, and are making no charge in respect of rent, lighting and heating. The committee are paying the salaries of the teaching staff, which consists of five tutors.

Klemm-Salmson at Brussels

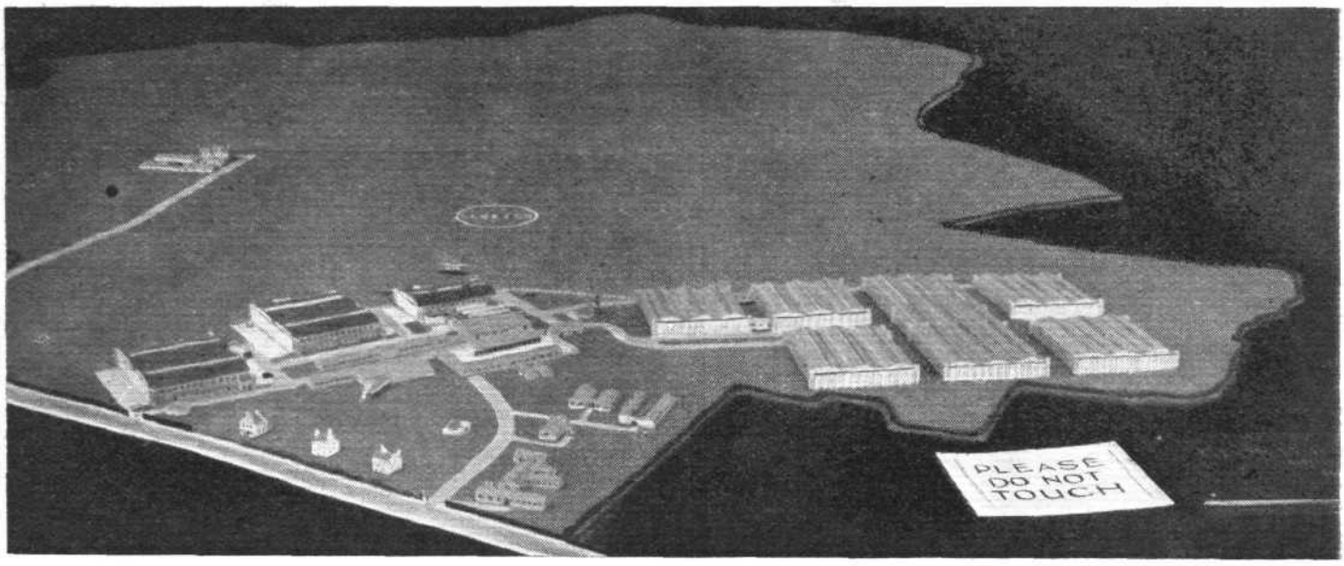
AT the recent Belgian Lightplane meeting at Brussels the Klemm-Salmson put up a very fine record in gaining the top score, namely 273 points out of a total of 320, also winning the King's Challenge Cup and a prize of 15,000 frs.

New Canadian Air Base

ARRANGEMENTS will be made for the establishment of an aeroplane base in the Lake Athabassa region, Canada, where new ore vein discoveries of promise are being tested.

Duluth-Fort William Air Service

THE Schlee-Brock Aircraft Corp., of Detroit, are operating an air service between Duluth, Minnesota, and Fort William, Ont. (Canada), employing six-to-eight-seater seaplanes.



A realistic model of the Gloster Aircraft Co.'s Brockworth Aerodrome at Cheltenham.

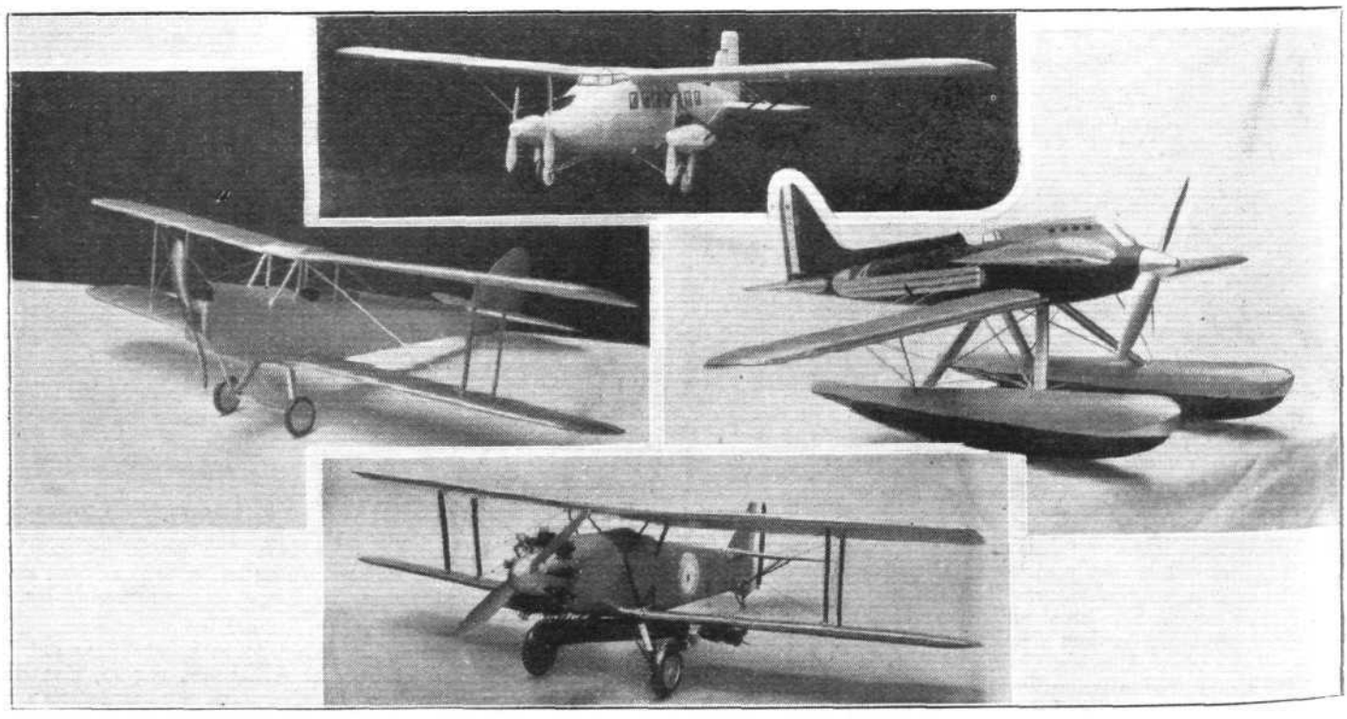
SCALE MODELS

TRUE-TO-SCALE models of aircraft are not produced entirely for the whims or amusement of aviation enthusiasts, but can, and do, serve a "useful" purpose in a variety of ways. As in practically all other industries a scale model, as correct in every detail as can be achieved in the size it is produced, of the full-sized subject (machine, building, ground lay-out, or whatever it might be), is often required for exhibition, experimental or similar purposes. In the aircraft industry, scale models of the different types of aeroplanes produced by a firm are frequently required for other than ornamental purposes.

A firm that has specialised in the production of scale models is the Models Manufacturing Co., of Causeway Place, 43, Newington Causeway, London, S.E.1, and the accompanying illustrations comprise a few examples of their work. This, it will be noticed, is not confined to scale models of aircraft only, but include scale models, or lay-outs of aerodromes, works, and the like. These latter are really excellently made and, as may be seen from the illustration of the Gloster Aircraft Company's Brockworth Aerodrome, Cheltenham, are wonderfully realistic. This model is on a scale of 35 ft. to 1 in., while a similar model of Heston Aerodrome has been produced on a scale of 70 ft. to 1 in.

This firm's scale models of aircraft also display excellent workmanship, and remarkable accuracy to detail considering their size. In the four examples shown below, the two Blackburn machines—the Commercial three-engined, six-seater monoplane and the "Beagle-Jupiter" Torpedo biplane—are on a scale of $\frac{1}{2}$ in. to the foot. An example of this detail work may be observed in the Bristol "Jupiter" engine on the latter model—in fact, we think our readers will agree that, looking at our illustration, it is difficult to tell this model from the "real thing."

The other models shown are of two world-famous machines, the de Havilland "Moth" and the Supermarine-Napier "S.5" Schneider Trophy winner of 1927. Both these models are built on a scale of $1\frac{1}{8}$ in. to the foot—that is, the "Moth" measures 2 ft. 6 in. in span, and the "S.5" 3 ft. span.



Scale models of four well-known types of aircraft: the Blackburn Commercial 3-engined monoplane (top), the Blackburn "Beagle-Jupiter" (bottom), the D.H. "Moth" (left), and the Supermarine "S.5" (right).

THE ROYAL AIR FORCE

London Gazette, October 22, 1929.

General Duties Branch

The following are granted short service commns. as Pilot Officers on probation with effect from and with seniority of Oct. 11 :—C. F. G. Adye, C. P. F. Alderson, I. O. Baldwin, J. N. Baxter, N. V. Bertram, B. W. E. R. Bonsey, M. Q. Candler, W. O. J. Coke, V. A. Dawson, C. C. M. Dunman, T. E. Dunville, F. P. R. Dunworth, N. Foster-Packer, H. M. Gahan, F. B. H. Hayward, N. Hill, M. V. Johnstone, N. D. Lamb, G. W. Lawson, D. MacGregor-Cheers, L. E. P. Mahon, D. E. Milson, W. S. Moody, P. E. L. A. Myers, R. W. H. Rayneau, E. G. Reed, P. A. Smith, J. F. Sutton, C. H. Williams, and S. M. Worrall. Lt. M. Cursham, R.N., is reattached to R.A.F. as a Flying Officer with effect from Oct 9 and with seniority of June 16, 1924.

The following Pilot Officers on probation are confirmed in rank (Oct. 12) :—J. Cherrill, R. P. Garnons-Williams, C. R. J. Hawkins, M. T. M. Hyland, B. A. Oakley, J. R. Stebbing, A. N. I. Worger-Slade. Pilot-Officer H. C. Parker is promoted to rank of Flying Officer (Sept. 17) ; Wing-Commander Sir Norman R. A. D. Leslie, Bt., C.M.G., C.B.E., is placed on the half-pay list, scale A (April 23 to July 24 inclusive) ; Wing-Commander Sir Norman R. A. D. Leslie, Bt., C.M.G., C.B.E., is placed on retired list at his own request (July 25) ; Flying Officer J. A. C. Florence is transferred to Reserve, Class A (Sept. 15). (Substituted for *Gazette* Sept. 17). Pilot Officer on probation C. W. Marriott resigns his short service commn. (Oct. 9).

Stores Branch.

Flying Officer P. P. S. Rickard is granted a permanent commn. in this rank (Oct. 1).

Accountant Branch

Flying Officer C. B. Rawlings, M.C., is transferred to Reserve, Class C. (Oct. 22).

Medical Branch

The follg. are granted short service commns. as Flying Officers for three years on active list with effect from and with seniority of Oct. 1 :—J. J. Corcoran, M.B., C. C. Fenton, M.B., B.S., B.Sc., C. G. Harold, M.B., A. Sheehan, M.B., D. D. Watson, M.B. E. A. Wilson, M.D., is granted a short service commn. as Flying Officer for three years on active list with effect from Oct. 1, and with seniority of Oct. 1, 1928.

Chaplains Branch

The Rev. H. Beauchamp, M.C., is granted relative rank of Group Captain on appointment as Staff Chaplain (Roman Catholic) (Oct. 17). The Right Rev. J. Dey, D.S.O., is placed on retired list at his own request (Oct. 17). The Rev. T. A. P. King relinquishes his short service commn. on account of ill-health (Oct. 23).

Memoranda

The permission granted to Lt. A. W. Archer to retain his rank is withdrawn on his enlistment in Supplementary Reserve (Oct. 2) ; 321458, Flt. Cadet C. R. Green is granted an hon. commn. as Sec. Lt. with effect from date of his demobilisation.

Erratum.—In *Gazette* of Oct. 15 (FLIGHT, Oct. 25, 1929), for Semphill read Sempill.

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. Pilot Officers on probation are confirmed in rank :—R. F. G. Lea (Sept. 3) ; H. Garnett (Oct. 16). The follg. Pilot Officers are promoted to rank of Flying Officer :—W. R. Walwin (Oct. 16) ; J. C. McE. Gibb (Oct. 19).

Flying Officer W. F. Parkinson is transferred from Class A to Class C (Sept. 30) ; Flying Officer P. E. Nicholl is transferred from Class B to Class C (Sept. 12). The follg. officers relinquish their commns. on completion of service :—Wing Commander.—H. R. Raikes, A.F.C. (Oct. 11). Flight Lts.—H. V. Stammers, D.F.C. (Mar. 10) ; D. C. Balfour (Oct. 1) ; R. E. Nicoll (Oct. 15). Flying Officers.—E. G. Richardson (April 20) ; H. W. Parker (Oct. 1) ; C. J. Watson (Oct. 1) ; W. J. Buchanan, D.F.C. (Oct. 5) ; C. W. Carleton, A.F.C. (Oct. 12).

Flying Officer J. M. Bell relinquishes his commn. on completion of service, and is permitted to retain rank of Flight Lt. (Aug. 7).

AUXILIARY AIR FORCE

General Duties Branch

No. 600 CITY OF LONDON (BOMBER) SQUADRON.—The follg. Pilot Officers to be Flying Officers :—E. A. Burton (May 25) ; A. B. Ferguson (June 2).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., to H.Q., R.A.F. Middle East, to command, 12.10.29.

Air Commodores : W. G. S. Mitchell, C.B.E., D.S.O., M.C., A.F.C., to Air Ministry (D. of T.), on appointment as Director of Training, 4.10.29. A. M. Longmore, C.B., D.S.O., to R.A.F. Depot, Uxbridge, Supernumerary, 15.10.29. The Hon. J. D. Boyle, C.B.E., D.S.O., to H.Q. Fighting Area, Uxbridge, to command (temporarily), 12.10.29. W. R. Freeman, D.S.O., M.C., to H.Q. Inland Area, Stanmore, for duty as Chief Staff Officer, 15.10.29.

Group Captain R. E. C. Peirse, D.S.O., A.F.C., to Station H.Q., Heliopolis, to command, 25.9.29.

Wing Commander A. C. Winter, O.B.E., to Aircraft Depot, India, to command, 8.10.29.

Squadron Leaders : K. M. St. C. G. Leask, M.C., to Aircraft Depot, India, 8.10.29. N. S. Douglas, to H.Q., R.A.F. India, 8.10.29 L. N. Hollinghurst, D.F.C., to No. 1 (Indian) Group, H.Q. India, 8.10.29. C. H. Elliott-Smith, A.F.C., to No. 55 Sqdn., Iraq, 8.10.29. R. C. Hardstaff, to Aircraft Depot, Iraq, 8.10.29. H. Stewart, to No. 84 Sqdn., Iraq, 8.10.29. E. C. Emmett, M.C., D.F.C., to Aircraft Depot, Iraq, 8.10.29. E. A. Fawcus, to Aircraft Depot, Iraq, 8.10.29. D. W. Clappen, to H.Q. Iraq Command, 8.10.29. C. S. Richardson, to H.Q. Iraq Command. T. E. Salt, A.F.C., to No. 1 Air Defence Group H.Q., 1.10.29. R. P. M. Whitham, M.C., to H.Q. Coastal Area, 11.9.29.

Flight Lieutenants : H. O. Long, D.S.O., to Aircraft Depot, Iraq, 8.10.29. F. W. W. Wilson, to Armoured Car Wing, Iraq, 8.10.29. D. R. Mitchell, M.B.E., to Aircraft Depot, Iraq, 8.10.29. V. M. Kenny-Leveck, M.B.E., to H.Q. Iraq Command, 8.10.29. J. W. Lissett, to No. 1 (Indian Wing) Station, India, 8.10.29. E. J. Ffoulkes-Jones, to No. 28 Sqdn., India, 8.10.29. R. Menzies, to No. 20 Sqdn., India, 8.10.29. A. H. H. Macdonald, to No. 27 Sqdn., India, 8.10.29. E. C. Delamain, M.C., to No. 27 Sqdn., India, 8.10.29. A. R. Jones, to H.Q., R.A.F., Transjordan and Palestine, 13.9.29. A. E. Lindon, M.B.E., to H.Q., R.A.F., Transjordan and Palestine, 13.9.29. G. H. Russell, D.F.C., to No. 30 Sqdn., Iraq, 1.9.29. A. C. Bayley, to No. 1 Air Defence Group H.Q., 30.9.29. E. H. Richardson, to No. 33 Sqdn., Eastchurch, 3.10.29. G. L. Ormerod, to No. 23 Group H.Q., Grantham, 2.10.29. J. Lawson, to No. 58 Sqdn., Worthy Down, 1.10.29. W. S. Allen, to H.Q. Wessex Bombing Area, Andover, 22.9.29. D. D'A. A. Greig D.F.C., A.F.C., to No. 9 Sqdn., Manston, 18.10.29.

Flying Officers : H. A. Evans-Evans, to H.Q., R.A.F., Transjordan and Palestine, 13.9.29. A. R. S. Davies, to R.A.F. Depot, Uxbridge, 11.9.29. L. P. Moore, to No. 30 Sqdn., Iraq, 1.9.29. S. F. Cole, to R.A.F. Depot, Uxbridge, 26.8.29. G. W. Gay, to No. 5 Sqdn., India, 8.10.29. J. B. Fyfe, to No. 20 Sqdn., India, 8.10.29. R. C. Higgins, to Aircraft Depot, Iraq, 8.10.29. A. T. C. Hazledine, to No. 70 Sqdn., Iraq, 8.10.29. R. A. T. Stowell, to. No. 84 Sqdn., Iraq, 8.10.29. C. I. Sempill, M.M., to H.Q., Iraq Command, 8.10.29. R. L. R. Atcherley, to Central Flying Schl., Wittering, 10.10.29. G. J. C. Mahony, to No. 603 Sqdn., Edinburgh, 9.10.29. P. R. Barwell, to Central Flying Schl., Wittering, 19.9.29. G. H. W. Selby-Lowndes, to H.Q., R.A.F., Middle East, 12.10.29. M. G. Philpott, to No. 4 Flying Training Schl., Middle East, 12.10.29. E. A. Jones, to No. 47 Sqdn., Middle East, 12.10.29. P. Kinsey, to No. 6 Sqdn., Middle East, 12.10.29.

Pilot Officers : J. W. Hawke, to No. 20 Sqdn., India, 8.10.29. H. J. A. Williams, to No. 31 Sqdn., India, 8.10.29. J. A. C. Stratton, to No. 28 Sqdn., India, 8.10.29. J. H. Manning-Fox, to No. 20 Sqdn., India, 8.10.29. W. R. Beaman, to No. 5 Sqdn., India, 8.10.29. H. G. Richards, to No. 28 Sqdn., India, 8.10.29. A. N. E. Hall, to Armoured Car Section, Aden, 8.10.29. D. A. L. Campbell, to. No. 208 Sqdn., Middle East, 8.10.29. K. R. Coates, to No. 202 Sqdn., Mediterranean, 3.10.29. H. M. Pearson, to No. 202 Sqdn., Mediterranean, 3.10.29. P. B. Rogers, to No. 25 Sqdn., Hawkinge, 3.10.29.

Stores Branch

Wing Commander C. L. Archbold, to H.Q., Aden Command, for Stores Staff duties, 8.10.29.

Flight Lieutenants : H. Cartwright, to Aircraft Depot, India, 8.10.29. H. E. T. Crocker, to Aircraft Depot, Iraq, 8.10.29. R. G. Sims, to Aircraft Depot, Iraq, 8.10.29. R. F. Wilson, to Supply and Transport Services, Iraq, 8.10.29.

Flying Officers : J. E. R. Sowman, to Aircraft Depot, Iraq, 8.10.29. J. McCarthy, to Aircraft Depot, Iraq, 8.10.29. C. W. H. Moller, to Aircraft Depot, India, 8.10.29. O. D. Allerton, to No. 2 (Indian Wing) Station, India. 8.10.29. L. L. Bray, to No. 208 Sqdn., Middle East, 12.9.29. P. Dennehy, to Stores and Supply Depot, Aden, 8.10.29.

Accountant Branch

Squadron Leaders : P. J. Farmer, to H.Q., R.A.F., Mediterranean, 3.10.29. A. R. Thomas, to H.Q., Wessex Bombing Area, Andover, 4.10.29.

Flight Lieutenants : K. R. Money, O.B.E., to R.A.F. Base, Malta, 8.10.29. R. F. C. Metcalfe, to H.Q., R.A.F., Cranwell, 2.10.29.

Flying Officers : F. Rigby, to No. 8 Sqdn., Aden, 8.10.29. A. W. Younghusband, to Aircraft Depot, India, 8.10.29. R. W. L. Glenn, to School of Army Co-operation, Old Sarum, 22.10.29.

Medical Branch

Squadron Leaders : T. C. St. C. Morton, M.D., M.R.C.P., D.P.H., D.T.M. & H., to H.Q., Iraq Command, 8.10.29. T. R. S. Thompson, M.B., to H.Q., Iraq Command, 8.10.29. T. Montgomery, M.B., D.P.H., B.A., to R.A.F. Depot, Uxbridge, 1.10.29.

Flight Lieutenants : R. W. White, to H.Q., R.A.F., India, 8.10.29. R. L. C. Fisher, M.B., to H.Q., R.A.F., India, 8.10.29. A. A. Townsend, M.B., to H.Q., R.A.F., India, 8.10.29. W. Gamblen (Quartermaster), to H.Q., Iraq Command, 8.10.29. J. P. Hederman, to No. 100 Sqdn., Bicester, 13.10.29.

Flying Officers : J. Kemp, M.B., to H.Q., Iraq Command, 8.10.29. C. Crowley, M.B., to H.Q., R.A.F., Middle East, 8.10.29.

R.AE.S. AND INST.AE.E.

A LECTURE will be delivered by Dr. A. E. Dunstan, President of the Institution of Petroleum Technologists, on Thursday, November 7, 1929, at 8.30 p.m., in the Lecture Hall of the Royal Society of Arts, 18, John Street, Adelphi, W.C.2. The lecture will be on "Recent Developments of Fuels and Dopes for Aircraft Engines."

Dr. Dunstan is one of the leading authorities in this country on the subject he has chosen for his lecture, and is the chief chemist of the Anglo-Persian Oil Company.

J. LAURENCE PRITCHARD, *Secretary.*

PERSONALS

Married

CAPT. R. H. MCINTOSH was married, on October 26, at the Savoy Chapel, to MISS BETTY ANSELL. Commander Archie Campbell, R.N., under whom the bridegroom served in the Merchant Service as a boy, was best man.

To be Married

The engagement is announced between FLIGHT-LIEUT. MALCOLM BRUCE MACKAY, R.A.F., younger son of the late Rev. E. B. Mackay and of Mrs. Mackay, of Worplesdon, Surrey, and KATHARINE, third daughter of the late BRIG.-GEN. W. ELLERSHAW, R.A., and of Mrs. Ellershaw, of Wymering, Cosham.

No. 3 Squadron, R.F.C., and No. 3 (Fighter) Sqdn., R.A.F. 10th Annual Re-union Dinner

THE above dinner will be held at the Hotel Cecil at 7.30 p.m. for 8 p.m. on Friday, December 6, 1929. Air Chief-Marshal Sir John M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C., will take the chair. Air Vice-Marshal Charles A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C., has been invited as Guest of Honour. Tickets at 12*s.* 6*d.* (wines extra, gratuities included) will be obtainable at the dinner. Former members of the Squadron wishing to attend are requested to inform Flight-Lieut. J. L. Airey, D.F.C., Hon. Secretary, Re-union Dinner Club, No. 3 (Fighter) Squadron, Royal Air Force, Upavon, Wilts.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

THE "A.A." AND AVIATION

[2211] Ten weeks ago I left Matyasfold, the airport of Hungary, having paid to the officials there close on £5 for the privilege of storing an Avian G-AAIX for two nights and three days. I had made four landings, three of which were the outcome of demonstration flights made at the request of the local students and their instructor.

On my return I wrote two letters, one to the Aviation Department of the Automobile Association and the second to the authorities in Budapest. In the latter I gave an approximate table of the charges obtaining in England, Belgium, France, Holland, Germany, Czecho-Slovakia, and Austria. Perhaps it would be as well to explain that, while the personnel at Matyasfold were charming and very helpful, the customs and meteorological services were not so charming and much less helpful.

From the authorities in Budapest I have had no reply, but the A.A. have, on the contrary, been very efficient. They at once took the matter in hand, and instituted not only full inquiries as to the charges made to me, but they also arranged that air tourists visiting Budapest should be charged upon an agreed scale, slightly less than the charges existing in this country at the present time, upon production of a certificate to be issued by the A.A.

Furthermore, they have forwarded to me a cheque from the Hungarian Government, being a return of three-quarters of the original charge.

I feel that this absurdly inexpensive service, not only so useful in reclamation, but also in the provision of maps, information and permits, etc., which the A.A. are providing for all their members who wish to travel abroad by air, cannot be too greatly appreciated or too widely known, more especially as their advice in the matter of aerodromes is very accurate and very sound. I have also found that the extension of the A.A. "hotel starring system" is of the greatest assistance upon arrival at an aerodrome where one's incapacity to speak the language, coupled with the very natural ignorance of the staff regarding the local accommodation, would otherwise render the selection of an hotel almost an impossibility.

London, E.C.2. JOHN G. CRAMMOND
October 24, 1929.

A CROYDON CRITICISM

[2212] Last Saturday my fiancé took me to have tea at the Croydon Aerodrome Hotel, as I was very keen to have the opportunity of seeing some of our latest airliners, and also those of other countries, arrive and depart. Having heard so much about preaching the gospel of airmindedness I naturally expected that the facilities offered to the public would be such that they would be encouraged to come again and bring others. It was rather a shock, therefore, when I was told that a charge was made for the discomfort of standing up in a railed-in enclosure, from which no better view was obtainable than anyone could get from the road, but much worse was to follow.

We entered the austere portals of the hotel under the disapproving gaze of a porter and asked for some tea to be served on the verandah. First we were told that we could not have what we liked but must pay 1s. 6d. for the set tea, which seemed unnecessarily high for what we got, and then I asked my friend what time the next machine came in. He was not sure and said he would look on the board in the lounge . . . then the storm broke. It seems that the management not content with charging so much for tea have done away with the aforesaid board and put in its place a notice to the effect that a list of arrivals and departures can be obtained on payment of two pence! Now, sir, I ask is such pettyness likely to encourage anyone to become sufficiently airminded to spend an afternoon at the chief of our airports?—Yours faithfully,

Victoria, S.W.1. October 28, 1929. J. P. C.

⁂ ⁂ ⁂ ⁂

Royal Air Force Memorial Fund

THE usual meeting of the grants sub-committee was held on October 24. Mrs. L. M. K. Pratt-Barlow, O.B.E., was in the chair, and the other member of the committee present was: —Squadron-Leader A. H. Wann.

The committee considered in all 12 cases, and made grants to the amount of £179 1s.

The next meeting was fixed for November 7, at 2.30 p.m.

PUBLICATIONS RECEIVED

Aeronautical Research Committee Reports and Memoranda: *No.* 1183. (*M.*57).—The Behaviour of a Single Crystal of Zinc Subjected to Alternating Torsional Stresses. By H. J. Gough and H. L. Cox. July, 1928. Price 1*s.* 9*d.* net. *No.* 1223 (*Ae.* 378).—On the Two-Dimensional Flow Past a Body of Symmetrical Cross-Section Mounted in a Channel of Finite Breadth. By A. Fage. Feb., 1929. Price 9*d.* net. *No.* 1229 (*Ae.* 384).—Loads on the Main Planes and Tail of an Aeroplane when Recovering from a Dive. By H. Bolas and G. A. Allward. August, 1929. Price 1*s.* net. *No.* 1232 (*Ae.* 387).—On the Maximum Load in Pulling Out from Vertical Dives. By S. B. Gates and H. B. Howard. Nov., 1928. Price 9*d.* net. *No.* 1235 (*Ae.* 390).—On the Stability of Controlled Motion. By W. L. Cowley. December, 1928. Price 9*d.* net. *No.* 1240 (*Ae.* 395).—Rolling and Sideslip Experiments on a Model Slotted Biplane of R.A.F. 31 Section. By H. B. Irving, A. S. Batson and A. L. Maidens. February, 1929. Price 6*d.* net. H.M. Stationery Office, Kingsway, London, W.C.2.

Aeronautical Research Committee Reports and Memoranda: *No.* 1228 (*Ae.* 383).—Full-Scale Control Tests on Fokker F.VII 3M Monoplane. By J. K. Hardy. Nov., 1928. Price 9*d.* net. *No.* 1230 (*Ae.* 385).—Pressure Plotting a Streamline Body with Tractor Airscrew Running. By C. N. H. Lock and F. C. Johansen. Jan., 1929. Price 1*s.* net. *No.* 1234 (*Ae.* 389).—Tests on Airship Models at Large Reynolds Numbers. By L. F. G. Simmons. Jan., 1929. Price 6*d.* net. H.M. Stationery Office, Kingsway, London, W.C.2.

Aeronautical Research Committee Reports and Memoranda. *No.* 1238 (*Ae.* 393).—The Effect of Body Interference on the Efficiency of an Airscrew. By C. N. H. Lock. December, 1928. Price 6*d.* net. *No.* 1239 (*Ae.* 394).—The Application of the Theoretical Velocity Field Round a Spheroid to Calculate the Performance of an Airscrew near the Nose of a Streamline Body. By C. N. H. Lock. December, 1928. Price 4*d.* net. *No.* 1241 (*Ae.* 396).—Experiments on a series of Symmetrical Joukowski Sections. By A. Fage, V. M. Falkner, and W. S. Walker. April, 1929. Price 1*s.* net. *No.* 1242 (*Ae.* 397).—The Force and Moment of an Oscillating Aerofoil. By H. Glauert. March, 1929. Price 9*d.* net. *No.* 1243 (*Ae.* 398).—Wind-Tunnel Tests on a Symmetrical Aerofoil (Gottingen 429 Section). By W. G. A. Perring. February, 1929. Price 4*d.* net. H.M. Stationery Office, Kingsway, London, W.C.2.

⁂ ⁂ ⁂ ⁂

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⁂ ⁂ ⁂ ⁂

AERONAUTICAL PATENT SPECIFICATIONS

(*Abbreviations*: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

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